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Railway Age Gazette

Volume 60. May 26, 1916. No. 21.

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An unusual and interesting feature of the new passenger terminal at Buenos Aires described elsewhere in this issue is the arrangement of the station tracks in groups of three between each pair of platforms. This is in marked contrast with the practice in the larger stations in the United States. The maximum train capacity of a passenger terminal layout is not dependent necessarily on the number of tracks. An adequate platform area properly arranged is necessary to expedite the handling of passengers and baggage. This has been accomplished at Denver by providing a platform on each side of each track to permit a segregation of passengers and baggage. The middle tracks at Buenos Aires were provided to permit the release of the locomotives of incoming trains promptly, a problem solved in this country by backing the trains out, or in the case of shuttle trains by releasing the incoming engine and attaching a second one at the rear of the train.

Arrangement of Station Tracks

An expert on the subject of publicity made the remark the other day that the statement of certain leaders of the train service employees that "We will not arbitrate" may take its place in history along with the famous remark attributed to W. H. Vanderbilt, "The public be d——d." There is some question as to whether Mr. Vanderbilt phrased his sentiment in just these words, or, if he did, as to whether he meant himself to be understood just as he always has been. But there is no question as to whether certain leaders of the train service brotherhoods have said in substance, "We will not arbitrate," or that they mean by it in effect just what Mr. Vanderbilt is credited with having said. With the formal negotiations between the National Conference Committee of Managers and the representatives of the employees soon to begin, both the employees and public should be made clearly to understand that either there will be arbitration of some kind or a strike, and that if the employees stand out against the former, as some of their leaders say they will, then a strike is the only alternative. The *Railway Age Gazette* would like to take a hopeful view, and predict there will be no strike. For anybody confidently to make such a prediction now is, however, merely to betray that he has no adequate realization of the existing situation. If the public wants to make sure there will be no strike it had better prompt its representatives at Washington to begin at once the steps toward the adoption of some measure that will prevent it. The most sensible plan yet suggested is that of the Chamber of Commerce of the United States to have the entire matter referred by Congress to the Interstate Commerce Commission.

"We Will Not Arbitrate"

The first essentials in a system of national defense are an adequate and efficient army and navy. Second in importance to them only, under modern conditions, is an adequate and efficient railway system. It is a remarkable fact that in his famous speech on preparedness, at the dinner of the Railway Business Association in New York, last January, President Wilson never once said the word "railroad." It is equally astonishing that in the discussions of the subject of preparedness in Congress the vital importance of railways has hardly been mentioned. The part of railways in such a system is, however, fully recognized by the military men of the United States and is being so intelligently discussed in some non-official quarters that it is only a matter of time until more attention will have to be paid to it in official quarters. The *Railway Age Gazette* publishes elsewhere in this week's issue an address on this subject which was made by W. L. Park, vice-president of the Illinois Central, at New Orleans on May 25. In many ways Mr. Park's address is the most enlightening which has been delivered. He gives a great deal of information concerning the present fitness of the railways of the United States to handle troops and equipment which he obtained from military experts. One of the most remarkable facts to which he directs attention is the lack of special railway equipment fitted to the transportation of heavy guns. He shows that the new 16-in gun being developed by the ordnance department is looked upon with special favor by military authorities, but that there is only one car in the country which is able to carry such guns, and this is owned by the Bethlehem Steel Company. The 14-in. gun must be transported on a 200,000-lb. flat car, with an ordinary flat car serving as a trailer, and, excepting the Norfolk & Western, practically no railway in the country owns any considerable number of cars of this capacity. One of the most

Railways as a Factor in Defense

important points made by Mr. Park is that under present conditions all the efforts made to put the railways physically into suitable condition might be defeated by a strike of employees such as that now threatened by the train service employees. A system of national defense which does not provide for the uninterrupted maintenance of railway transportation is fatally weak.

THE CANADIAN RAILROAD CRISIS

THE Canadian House of Commons passed on the same day a bill which provides for lending the Canadian Northern $15,000,000 to tide it over for a year and a bill appropriating $150,000 for the expenses of a commission to make a thorough investigation of the whole railroad situation. Canada is face to face with a crisis in her relations with the Canadian Northern and the Grand Trunk Pacific. There are three alternatives which are being seriously discussed: The government can continue to lend money to these railroads until such time as they can begin to earn their fixed charges; or the government can refuse to continue lending money, with the result that default will occur and receivership for both the Canadian Northern and Grand Trunk Pacific apparently inevitably take place; or, lastly, the government can take over the two roads and add the 3,550 miles of the Grand Trunk Pacific (including the National Transcontinental) and the 4,966 miles of the Canadian Northern to the 1,889 miles of railroad now operated by the Canadian government.

All of the stock of the Grand Trunk Pacific is held by the Grand Trunk. Part—about 75 per cent—of the cost of building the Western division of the Grand Trunk Pacific was raised by the issue of bonds bearing the guarantee of the Dominion government and the remainder by bonds guaranteed by the Grand Trunk, and by bonds guaranteed by one or other of the provinces. The government itself built the Eastern division of the Grand Trunk Pacific (National Transcontinental) and the portion of this which is now being operated, is being operated by the Intercolonial. The Canadian Northern stock is owned 40 per cent by the Canadian government and 60 per cent by Mackenzie, Mann & Co. The Canadian government guarantees $45,000,000 of the company's debenture bonds and has made both cash and land grant subsidies to it. Some of the provinces have guaranteed certain issues of bonds.

The securities of both the Grand Trunk Pacific and the Canadian Northern are very largely held in England. The Grand Trunk would probably be glad rather than sorry to give gratis its stock of the Grand Trunk Pacific to the government if it were thereby relieved of its guarantee of Grand Trunk Pacific bonds. For the government to get hold of the 60 per cent of the Canadian Northern stock held by Mackenzie, Mann & Co., however, would be a very different undertaking. It is hardly conceivable that Sir William Mackenzie would relinquish control of this stock without a bitter fight, and he has the reputation of being a very good fighter.

Most thoughtful and patriotic Canadians agree that default on either Grand Trunk Pacific or Canadian Northern bonds, with resulting receivership, would be a blow to Canada's credit which should not be even considered. In the debates which have recently taken place in the House of Commons there have been members who urged that if one-seventh of the railroad mileage of the United States was in the hands of receivers it would be no unbearable calamity if the two Canadian roads which could not earn their fixed charges went into receivers' hands. But their urging has been half-hearted and, when it came to a vote, they followed the lead of those who hold that receivership must be averted at any cost.

It narrows down, therefore, to a choice of continuing to advance money or of government ownership and operation. As a matter of fact, however, there is nothing, or nearly nothing, for the government to own at present. The equity in either the Grand Trunk Pacific or Canadian Northern after creditors' claims is nil. Whether such an equity will be created in the future depends on the growth of the country and wisdom and foresight in the management and development of the two railroad properties. The question therefore is as to whether government operation or private management will most quickly develop this potential equity. It is illuminating to see that even the strongest advocates of government operation are moved either by political motives pure and simple, or a fear that private management will some way or other get the best of the government and get for private individuals the benefits which should be divided with the general public. There is hardly a man who makes even a pretense of urging that government operation would be more economical or more progressive or better in any way than private management. Does not this fact in itself help to answer the question that is before the Canadian people? It ought to.

If a commission of experts is to be appointed to study the Canadian railroad situation the commmissioners should bear in mind that the question in the Grand Trunk Pacific and Canadian Northern cases is not whether government ownership is a good thing or not but whether private management or government operation is more likely to create something for anyone to own.

RAILWAY FUEL ASSOCIATION CONVENTION

WITH respect to covering the fuel field on American railways, the eighth annual convention of the International Railway Fuel Association, held in Chicago last week, can be classified as one of the most successful conventions this association has ever held. Of special importance was the paper of W. H. Averell on "What the Transportation Official Can Do to Promote Fuel Economy." Mr. Averell placed the responsibility for the economical use of fuel directly up to the higher railway officers, explaining that without their active interest and co-operation the best results in fuel economy cannot be expected. He outlined a splendid plan for a fuel organization and emphasized its importance by referring to fuel as a single item for which railroads spend seven cents out of every dollar earned.

Of no less interest and importance was the committee report and discussion on Powdered Coal. This association has the distinction of being the only organization, up to the present time, giving out any information on this increasingly important subject. The reports last year and this year contain practically all the information concerning the use of this kind of fuel on locomotives that is available for publication.

The problems in fuel inspection and coal analysis were discussed and if studied carefully will be found to be of material assistance in the purchase of fuel. It was shown how the energetic fuel inspector could be of greater service to his road by observing what is "going on" at the mines. In the coal analysis the importance of accurate sampling of the coal was emphasized and the mistake of purchasing coal on a B. t. u. basis alone without consideration being given to the composition of the ash was shown to be quite common. Of no less interest to the mechanical department was the paper on the "Care of Locomotives with Relation to Fuel Economy." The locomotives must be properly maintained if economical use of fuel is to be expected of the engine crew. As has been said many times, there is nothing more

disheartening to an engine crew than an engine that "doesn't steam." If co-operation is desired of the enginemen they must be given proper tools with which to work and that means a well maintained engine.

The Fuel Association is covering a field which by many roads is neglected. Its work is becoming more important each year and with greater co-operation from those railways which do not now send representatives to the conventions its work will still further progress. Perhaps the economies which are said to be possible are believed to be exaggerated. If so, Mr. Felton's address will show what can be accomplished on a road like the Chicago Great Western.

PRIVATE VS. GOVERNMENT MANAGEMENT

WHEN the war in Europe began the management of the railways of Great Britain, which are all privately owned, was concentrated in the hands of a committee of their own general managers with a member of the cabinet as titular chairman, and with one of the general managers as vice-chairman and the active head of the committee. Under this direction the British railways have been remarkably successful in handling expeditiously all of the enormous military traffic, including soldiers, supplies and equipment, which has been turned over to them. The efficiency they have shown, which has been admitted on all hands, has been celebrated by the advocates of public ownership in this country as a triumph of government management. This is not the way in which the matter is regarded where the facts are known and understood. Lord Claud Hamilton, the chairman of the Great Eastern Railway, is also a member of the House of Commons and an active public man. In an address at the annual meeting of the stockholders of the Great Eastern on February 11, Lord Hamilton drew the following contrast between the way in which the British government's business has been handled by the government, on the one hand, and by the railways on the other since the war began and between the conditions which have produced such widely differing results:

> Does it not strike you how marked is the contrast of the smooth and successful working of the gigantic task imposed upon the committee of general managers with the reckless and haphazard manner in which much of the work also under, or partially under, government control has been administered? The reason of the difference is obvious. In the one case the work has been performed by practical, trained business men; in the other case the preponderance of politicians, lawyers and government officials—in many instances without any real business experience—has been the cause of a terrible waste of public money, of inefficiency, and of unpardonable delay. These mistakes are, I am glad to say, being gradually rectified; but the war has been in progress for one year and seven months, and it seems a grave reflection upon our system of government that such maladministration should have been possible, and in the best interests of the country it is greatly to be deplored.

It is probable that the efficiency with which Germany has conducted her military operations has been partly due to the fact that the government manages the railways. But, under the autocratic government of Germany public business is entrusted to trained and experienced administrators, not to a "preponderance of politicians, lawyers . . . in many instances without any real business experience." If the government had owned the railways of Great Britain their management, like that of other government departments, doubtless would have been in the hands of a "preponderance of politicians and lawyers" without any business experience. The result would have been that on them also there would have been "a terrible waste of public money, of inefficiency and of unpardonable delay." As the *Railway Age Gazette* frequently has remarked, the autocracy of Germany, and the governments of England, the United States and other democratic countries, do not do business in the same way. Until democratic peoples are prepared to show [illegible]gence, make the sacrifices and submit to the discipline necessary to secure efficient government they will not have it, and until they get efficient government they will best promote their own interests by entrusting to public officials as few enterprises as possible whose good management requires the exercise of administrative ability.

NEW BOOKS

Railway Regulation. By I. Leo Sharfman, professor of political economy, University of Michigan. 236 pages, 5½ in. by 8 in. Bound in limp leather. Published by LaSalle Extension University, 2550 South Michigan avenue, Chicago. Price $2.

In this work the author has attempted to analyze the leading problems in railway economics in their relation to government regulation, showing that the need for railway regulation arose not from any conclusive evidence as to the extortionate character of the general level of American railway rates, nor from any difference between railway men and other men, but from certain inherent characteristics of the railway business, particularly those pertaining to railway rates. Instead of blaming the railroads for the conditions which led to the demand for governmental interference in their affairs, as so many writers have done, Professor Sharfman lays emphasis on the character of railway competition and the effects of the combination of circumstances produced by the fact that a railway has, as to a part of its business, a virtual monopoly, while as to its other business, it is subjected to the keenest competition. This condition, combined with the difficulty of ascertaining definitely the exact cost of a given service, he argues, has given railway transportation an economic character from which the need of regulation clearly follows.

The opportunity to reduce unit costs which, other things being equal, naturally accompanies an increased volume of business, he says, tends to a condition of ruinous competition between railways that cannot be relied on as a regulating force because it introduces evils of its own that are in themselves prejudicial to public welfare, and because it is liable to go to such abnormal extremes as to become self-destructive. Co-operation of some sort to limit the competition almost invariably follows, and, the author says: "Government regulation is necessary to correct the evils which are inseparable from railway competition, whenever bona fide rivalry exists, and to prevent the abuse of monopolistic power, whenever, as is the normal tendency in the railway business, operations are conducted under monopolistic conditions."

He does not fail, however, to note the inconsistency of attempting to preserve the conditions of unlimited competition in combination with a policy of regulation, for he says that: "It is necessary to recognize that the law against discrimination would gain in effectiveness through the repeal of the anti-pooling section of the act to regulate commerce" and that "with the large powers of regulation now vested in the Interstate Commerce Commission and in most of the state commissions, the legalization of pooling under government control would involve little danger of abuse and great possibilities of relief alike to the railways and to the public." He also clearly appreciates the evils attendant upon our present system of competition in regulation between 48 states and the federal government, saying that, "in railway regulation the prevailingly national character of American commerce and industry obviously necessitates a single unified control."

While written primarily as a text book for a course in railway traffic, the book should prove of value and interest to all who are interested in the subject of railway regulation. It is a peculiarly broad-minded and fair analysis of the reasons for and the nature and purpose of the changes that regulation has brought about in the transportation field. The first three chapters are devoted to an explanation of the historical development of regulation. One chapter is devoted to railway competition, another to the theory and practice of rate-making followed by chapters on regulation of railway rates, railway discriminations, regulation by the state, the conflict between state and federal authorities, and federal regulation.

Letters to the Editor

BETTER FLAGGING

St. Louis, Mo.

To the Editor of the Railway Age Gazette:

In view of the recent serious rear collisions in widely separated parts of the country, it seems advisable for us to look about us a little to see if our present somewhat antiquated and more or less crude flagging methods might be improved on in any way. This, of course, leads us back to our much discussed old friend, "the flagman." While admitting the fact that in some cases the man himself and not the method is at fault, may we not for a moment overlook the human element and inquire somewhat as to what may be done in the way of providing additional and progressive methods, rules and appliances for simplifying and safeguarding the procedure, and assisting in overcoming the human element of errors in judgment and action, as far as may be in our power?

In the first place, our present standard code rules are indefinite and indistinct on the matter of a flagman's equipment in that they do not specify definitely and distinctly just what signals shall be actually carried by a flagman when going back to flag, as well as just what supplies of signals should be kept in reserve on the train, and leave the very important matter of just what signals are to be *actually carried back when flagging*, to the judgment and opinion of each individual flagman.

A tentative proposed new flagman's equipment rule which is now under consideration by the Train Rule Revision committee of the American Association of Railroad Superintendents seems to cover the matter fairly well. The radically progressive principle of a flagman being required to take with him two or three fusees when flagging during the day the same as at night, for use during unexpected fogs, blizzards, oncoming darkness, when held out until after sunset, etc., in order that he may be absolutely equipped for any and all emergencies arising, without special thought before starting out, is having considerable agitation and the support of a good many progressive and practical transportation officers and trainmen, as being an important safeguard to adopt. This brings up the question of supplying flagman with a proper, light and compact protective carrying case, which should hold the required amounts of signals decided upon as necessary, in addition to his lanterns.

The proposed rule reads as follows:

"All employees whose duties or the rules require them to flag trains (except at flag stops as prescribed by rule 28) shall be provided with and carry with them at all times when on flagging duty, day or night, a standard safety flag, consisting of the following articles in good order and ready for instant and effective use: one weatherproof signal case with strap, containing one protected red flag with the staff inseparable from the signal case, six standard torpedoes, or two standard fusees and one box of waterproof matches.

"In addition to the above safety flag and signals, they shall also carry one lighted red lantern and one lighted white lantern between sunset and sunrise, and at other times when necessary through the day signals becoming indistinct or imperfect through fog or other causes. An additional reserve supply of not less than 12 standard torpedoes and 6 standard fusees shall be carried on each train.

"The employees required to be provided with and to carry signals as specified by this rule are: flagman or rear brakemen (passenger and freight), firemen or head brakemen (passenger and freight), operators (telegraph and signalmen), track department (section and extra gang foremen, track walkers, track watchmen), bridge department (bridge, pile-driver and other gang foremen, bridge tenders and bridge watchmen), signal department (gang foremen, repairers, maintainers), mechanical department (wrecker foremen) and other employees using or obstructing the main line with power or hand cars or other obstructions or who are required by their duties or the rules to flag trains."

In support of the rule it may be said that the term "carry" as at present generally used and understood, seems to be a misnomer and misleading in that it is used and generally understood as applying to the equipment of signals to be "kept" on the train, rather than to be "actually carried" by flagmen when going back to flag. Present rules covering flagging equipment cover only the total number of signals to be carried on the train, generally in train boxes or in large heavy cans on the rear platform, instead of specifying definitely the exact amounts and kinds of signals to be actually carried by flagman when going back to flag, thus leaving this very important matter open to the discretion and decision of each individual flagman. Also the present generally-used list of 6 fusees and 10 to 12 torpedoes is impracticable, in that these specified quantities are too many for a flagman to actually carry, and not enough for a reserve train supply, and non-elastic as to demands of different runs.

Present rules provide only uncertainly for the carrying and use of fusees when day signals become imperfect through unexpected fogs, flagman being held out until after sunset, etc., and again leave the important matter open to the discretion and decision of each individual flagman, as to the advisability of taking fusees along when going back to flag. It is submitted that after a flagman is a half-mile away from his train and encounters an unexpected fog, snow storm or oncoming darkness, it is too late to discover that he needs fusees and did not bring them with him, however large a supply he may have on his train. It is further submitted that the only safe proposition is that a flagman actually carry fusees at all times when flagging, both day and night, in addition to his other signals, in order that he may be absolutely equipped for all emergencies arising. Grant Selby.

SLIPPING OF LOCOMOTIVES

Columbus, Miss.

To the Editor of the Railway Age Gazette:

I have read with considerable interest the communication signed by W. G. Landon which appeared in your issue of February 11, relative to the use of the steam chest pressure gage on French locomotives as a means of preventing slipping. This, in my opinion, is an indication that the locomotives in question either have a tractive effort that is badly out of proportion to the factor of adhesion, or the device is to be used when the sanding apparatus is inoperative. If the designer of a locomotive overlooks the proper ratio of adhesion, and it is necessary to manipulate the throttle, or wire-draw the steam to prevent slipping, he has made a great mistake as the locomotive is being robbed of its efficiency and can not be working to its full capacity. Aside from this, the engineer's attention would be confined to the steam chest gage and throttle while on hard pulls, which might be otherwise detrimental to the service.

The factor of adhesion should be of such proportion to the tractive effort that it will permit the throttle to be opened to its full capacity on hard pulls in full gear without slipping under ordinary conditions. By the occasional, sparing use of sand, full tonnage rating should be handled successfully over all grades. There are certain rail conditions, however, that lessen the friction, which would require careful attention both to the throttle and the sanding apparatus. Sand should be used sparingly for two reasons; first, use only enough sand to prevent slipping, as more than enough is a waste of sand which may be needed later; second, the

excessive use of sand will increase the wheel resistance and sometimes may stall the train.

Mr. Landon is right about the variations that take place after alternating cut-offs. I have found that locomotives have a greater tendency to slip when the cranks are below the center line, at which point the tire begins to flatten.

F. E. PATTON,
Superintendent, Southern Railway.

EIGHT-HOUR DAY ON CONSTRUCTION WORK

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

If the so-called eight-hour day, for which the railway orders are contending, becomes effective, it will have a marked effect on the cost of work-train service on construction and maintenance work, and engineers who are engaged in this class of work will no doubt be interested in knowing what this will mean in dollars.

When bridge and track crews work 10 hours per day it has been found that it is necessary for the work-train crews to work about 13 hours per day. This is one class of train service where it will not be possible to reduce the time to an actual eight-hour day. It is necessary for work trains to tie up at some point where coal and water are available, and as this often means a run of 25 to 50 miles, night and morning, it is necessary for the train crew to put in two to four hours more per day than the bridge or track crews they serve.

To show what the increase would mean in dollars, I show here the present rates of pay on one of the roads in the Middle West, and also the rates that would have to be paid under the demand for ten hours' pay for eight hours' work, with time and one-half pay for overtime.

It will be noted that at the new rate the engineer would receive $281.96 per month, or $3,383.52 per year if he worked the entire time, but as the construction season lasts only about seven months it would probably be necessary for him to go back to firing. He would then receive only $150 to $175 per month, according to the amount of overtime he succeeded in getting in, or if he did not spend too much on picture shows, etc., during the summer he would, very likely, have enough left of the $1,973.72 he had received for his seven months' work so that he could take a short vacation.

In nearly all classes of railway construction work the cost of work-train service is an important item of expense, and in some classes of work, such as driving piles on the main line, and spotting cars in a gravel pit, the wages of the trainmen and enginemen constitute about 25 per cent of the cost. This is also an important item in the expense of unloading ballast and track material, unloading concrete bridge and culvert material, and handling steel erection derricks.

To anyone familiar with railway construction work the attitude of the men as to a real eight-hour day is well known. The work is easy, the hours regular and the men are out for the money and want to put in as many hours per day as they can find any excuse for doing.

I recall the complaints that arose and the threats to quit the work-train service, where men held rights for regular trains, when an order limiting work trains to 12 hours per day was proposed.

Is the increase demanded by the train service men justifiable as compared with the salaries paid to other classes of railway employees? On the construction work mentioned above, under the present schedule, the locomotive engineer receives more per month than the assistant engineer in charge of grading and bridge work on 50 to 80 miles of line, or the roadmaster in charge of the track-laying and ballasting. The conductor receives more per month than the resident engineer in charge of 10 to 15 miles of construction, and the fireman and the brakemen each receive more per month than the instrumentmen, inspectors or draftsmen.

The cost of living has increased alike for the organized and the unorganized employees of the railways, while the increase in compensation has been more favorable to organized labor, and I think there is a feeling among the unorganized forces that every increase granted to organized labor makes it harder for other employees to secure merited advances in wages. I recall a case of a locomotive engineer being appointed trainmaster, who, after a six-month trial, went back to his engine, saying, "there was too much grief for the money with no limit to the hours and no overtime for a trainmaster."

CONSTRUCTION ENGINEER.

PRESENT SCHEDULE—10 HOURS' PAY FOR 8 HOURS' WORK, 1½ TIME AFTER 8 HOURS

	Present wages				Proposed wages				
	For 10 hours	Average day 13 hours	Average month 28 days	Per hour	For 8 hours	Average day 13 hours	Average month 28 days	Increase per month	Per cent of increase
Engineer	$5.20	$6.76	$189.28	$0.65	$5.20	$10.07	$281.96	$92.68	48.96
Fireman	3.25	4.225	118.30	.40625	3.25	6.30	176.40	58.10	49.11
Conductor	4.18	5.434	152.15	.5225	4.18	8.10	226.80	74.65	49.06
Brakeman	2.78	3.614	101.19	.3475	2.78	5.386	150.81	49.62	49.03
Brakeman	2.78	3.614	101.19	.3475	2.78	5.386	150.81	49.62	49.03
Entire crew	$18.19	$23.647	$662.11	$2.27375	$18.19	$35.242	$986.78	$324.67	49.04

DISCIPLINE OF ENGINEMEN

NEW YORK CITY.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The writer has read your article, April 28, on the Lookout on the Locomotive, and heartily agrees with the author's findings. In one place he says: "The superintendent, therefore, who aims to keep the morale of the force high must have a rigid system of putting only the best men on the most important trains; . . . and forbidding men to go on duty when sick or tired or worried . . ."

Would it not then be an excellent plan to prepare proper blanks that must be signed by the enginemen and firemen, before going out on their runs? They should affirmatively declare that they are not sick, tired or worried, and know of no mental or physical reason why they should not go out. These papers, signed, could be filed in office of the division superintendent and the declarations therein contained would relieve the management of the suspicion, at times of accident so manifest in the daily papers and in the minds of the traveling public, that these two very important employees were not in mental or physical condition to assume the great responsibility laid upon them.

Important facts that tend to show the never-ceasing care that the railroads give to the question of safety should be heralded far and near; this in justice to the various managements.

C. H. WADELTON.

USE OF RUBBER AVOIDED ON AUSTRIAN AND GERMAN RAILWAY EQUIPMENT.—According to an Austrian railway paper the railways in the countries of the Central Powers have substituted metallic flexible connections for the rubber hose used for continuous brakes, and steam-heating apparatus and a coal tar oil for lubricating the axles of rolling stock. The latter is made principally from anthracene, and is in various grades of viscosity, according to the purpose for which it is to be used.

Interior of Delaware, Lackawanna & Western Fuel Instruction Car

THE report of the early part of the eighth annual convention of the International Railway Fuel Association was published in last week's issue, page 1081. Following is the report of the rest of the convention:

ADDRESS BY MR. FELTON

S. M. Felton, president of the Chicago Great Western, gave a talk on the railway fuel problem. He explained the practice of handling fuel in previous years, saying in part as follows: On the Pennsylvania's western lines during the seventies the coal was weighed into the pockets and every engineer was charged for the amount of coal taken on the tender. The advantage of this system was clearly shown by reduced consumption. The first mechanical type coaling station to be generally introduced in railway service was on the Chicago & Alton between 1899 and 1907. On that road the amount of coal consumed per 100 net tons moved one mile was 116.08 lb. in 1899 and 52.06 lb. in 1907, a decrease of 55 per cent.

Referring to the fuel problem of the present time, Mr. Felton called attention to the results obtained on the Chicago Great Western. In 1909 that line was equipped with the old-fashioned chutes, the coal being unloaded at a cost of about 10 cents per ton. These were replaced by modern mechanical stations of the conveyor or balance bucket type, and by means of a registering device duplicate tickets are printed showing the actual amount of coal taken from the bins at any time. The company provides self-clearing cars designed to handle the coal in the most economical manner, and keeps these cars in the company coal trade. This makes it possible to handle the coal at these stations at a cost ranging from two to three cents a ton, depending on the tonnage handled. This cost includes the maintenance charges.

When contracts are made the analysis of the coal and the heat value are specified. Samples of the coal are taken and analyzed every two weeks, and in addition a coal inspector is at the mines to observe the condition of the coal delivered, check the weight and keep the superintendent advised of any irregularity. It takes about six or seven hours to make a coal analysis, and the cost for labor and chemicals is about $2.90. The cost of equipment and chemicals necessary for testing coal amounts to about $305. Adding to this the equipment necessary to make water analysis the total cost will be about $400. The expense involved is infinitesimal, compared with the benefits obtained.

On the Chicago Great Western the actual weight of the coal in the tender of a locomotive is reported to the chief despatcher before the train starts. Coal taken at intermediate coaling stations on the road is reported by wire. Upon arrival at the terminal the coal on the tender is leveled off by men assigned to that duty, and the amount remaining is determined by means of measuring strips on the inside of the tender. This is also reported to the chief despatcher, who is then able to figure the exact amount of coal consumed on the run.

The improvements that led to fuel economy in the way of mechanical coaling stations, larger power, superheater locomotives, brick arches and close supervision were first started on this road between Oelwein, Iowa, and Chicago. On this division the results in passenger service in 1915 as compared with 1911, when the system was first put into force, were as follows: The train mileage increased 1.5 per cent, the tons of coal consumed decreased 28 per cent, the cost decreased $25,851, or 28 per cent, and the pounds of coal consumed per passenger car mile decreased 31.7 per cent. In freight service between 1911 and 1915, the trainload increased from 505 to 790 tons, or 56 per cent; the gross ton miles increased but 1 per cent, the tons of coal consumed decreased 27 per cent, the cost decreased $94,671, or 27 per cent; the tons of coal consumed per 100 gross tons moved one mile decreased 28 per cent, the price per ton having remained practically the same. A series of tests has demonstrated that the ordinary road engine does not make a desirable switcher and is anything but economical in fuel consumption in that service, so engines specially designed for switching service, superheated and with brick arches and all the latest devices for the prevention of smoke have been adopted.

We are approaching a period when the most important

work in connection with fuel economy is, I think, before you. The use of powdered coal will undoubtedly give the most satisfactory results that can be looked for outside of the use of oil, and I look forward to the work you are doing in that direction with the greatest possible interest. You certainly should, and no doubt will, be encouraged in this work to the greatest possible extent by your executive officers.

In conclusion, the lesson to be drawn from this talk is:

First—Check-weigh and analyze coal at frequent intervals, as received from the mines.

Second—Weigh all coal to individual locomotives; keep records of the coal consumed, not only by locomotives, but by engine crews as well.

Third—Check the individual performance of locomotives and crews against the actual gross tons handled per freight train mile; per car mile in the case of passenger trains, and per hour worked by yard engines.

Fourth—The responsibility for the coal from the time it is mined to its final consumption should be fixed upon the division superintendent, so there may be no conflict of authority.

Fifth—In the purchase of new locomotives, specify superheaters and brick arches of some approved form; similarly equip all old engines where age and capacity justify the expenditure.

FUEL ECONOMY AND THE TRANSPORTATION OFFICER

By W. H. Averell.

General Manager New York Properties, Baltimore & Ohio

The big and important subject of what the transportation officer can do to promote fuel economy must be considered from two somewhat different viewpoints:

First—What the general or executive transportation official can do; and

Second—What the division official can do.

The chief transportation official, be he transportation vice-president or general manager, should have a staff organization or a staff bureau, reporting directly to him. This bureau, under the guidance of the chief transportation official, should have charge of all matters pertaining to the purchase and distribution of locomotive fuel, its proper and economical use, and also, in order to insure the proper economical use, the organization should have supervision of the educational work which should be carried on in connection with locomotive fuel consumption and matters pertaining thereto. It may be argued that this department, or bureau, should properly be under the jurisdiction and report to the head of the motive power department. But, as the cost of coal is directly chargeable to transportation expense, and as the hiring and promoting of engineers and firemen and the proper training of them in their work as regards the use of coal is an operating and not a mechanical problem, it stands to reason that better results will be obtained by having the fuel department part of the operating or transportation organization, rather than part of the motive power organization.

The chief transportation official should constantly watch to see that the bureau, through overzealousness, or because of anxiety to make a good or a remarkable showing in its particular field of activity, does not attempt to further its own ends at the expense of other branches of the service. Such overzealousness is apt to prove extremely demoralizing.

The fuel department should have selected for its head a man of sufficient training and experience, a man of broad enough judgment and poise, to insure all matters pertaining directly to fuel consumption—and in some cases indirectly to fuel consumption—being studied and passed on in a careful, considerate and intelligent manner. The chief of the department should be a strong enough man and a big enough man to inspire the confidence and respect of the coal operators and the public, with whom he comes in contact; also to insure him, and his department as well, the co-operation of all the general officials of the transportation department, the motive power department officials, and the officials of other departments with whom he has dealings. He should be an important person, with sufficient authority to handle and dispose of most of the various fuel problems, without having to refer them to his superior for final decision. He must be a person who knows how to think and plan, and one who knows how to train and educate others, as to a large extent he acts as a teacher who, by studious application, masters his subject from every angle, and thus gradually, step by step, makes his pupils—superintendents, road foremen of engines, master mechanics, engineers, firemen, hostlers, coal tipple men, trainmasters, despatchers and many others—in turn familiar with the subject, helping them by his superior and more intimate knowledge to solve the various problems which the fuel subject presents. The extent to which a fuel organization is successful at all depends on the ability of the head of the organization. Therefore unusual care should be taken in making a proper choice. A poor appointment might very possibly be worse than no appointment at all.

Great stress and emphasis have been laid on the selection of the right type of person for the head of the fuel department, as this is all important. We have big men at the head of our motive power department, who supervise the expenditure of eighteen cents out of every dollar railroads earn, this money being spent on repairs to freight cars, passenger cars, engines, shop tools, machinery, etc. We have big men at the head of our maintenance of way department, who supervise the expenditure of twelve cents out of every dollar railroads earn, these expenditures being for rails, ties, buildings, yards, terminals and docks, etc. Why, therefore, when railroads spend seven cents out of every dollar earned on the one single item, fuel, should the department watching that important item have for its head a man of meagre ability?

In inaugurating a fuel department we should not at the start attempt to work on a very elaborate or very detailed plan, but should begin by making plain to all, in a simple but positive manner, the immensity and importance of the fuel subject, the effect it has on operating ratios and interests, and then some of the easiest and most practical methods by which fuel can be used to better advantage and with greater economy.

To help him, the head of the fuel organization should have one or more road men, who will have the title supervisor of locomotive operation, or a similar comprehensive title. This supervisor will be required to watch, on the line of road, all matters pertaining to fuel performance. He should outline and explain and follow up the schemes, ideas and methods which his immediate superior at the head of the bureau is gradually putting into effect. He should act as a "go-between" between the general office organization and the general and division superintendents, master mechanics and road foremen of engines. The locomotive supervisor can be made and should prove a very valuable aide to a general superintendent; in fact, the general superintendent ought to consider him one of his most valuable assistants; this despite the fact that the supervisor does not report directly to the general superintendent, but, instead, to the fuel department.

Coal is purchased on various railroads by different officials. Sometimes these officials are at the head of a department, as, for instance, the purchasing agent, or sometimes a subordinate official. While some objections might properly be raised against the purchase of this article by the operating department, which department ordinarily buys nothing, so much of this one commodity, coal, is used, its haul and distribution have such an effect on operating costs, and the having of an adequate supply of the right kind of coal has such an important bearing on the locomotives, and on their performance in service, that it would seem that usually this particular article could be most advantageously contracted for by the department which uses it rather than by any other depart-

ment. The operating department when in charge of fuel purchases is often in a better position, and often more apt to consider kindred subjects which have direct bearing on operating expenses, such as direction and length of haul, car supply, change in type or design of locomotives, fluctuations in traffic, etc., all of which are immensely important items and which should be under constant watch and control. The operating department is in position to learn more quickly and more directly when any particular coal or any particular groups of coal fail in certain sections or branches of the service, and therefore can more quickly apply corrective measures and remedies.

As those purchasing coal should be responsible for knowing that they are getting what they are paying for, the fuel inspectors should be under the complete control of the fuel department; and even if it should be thought by some too radical a step or a wrong policy for the fuel department to buy the coal, it certainly is not a mistake to have this organization inspect it.

Good team work between the motive power department and the fuel department is of prime importance, and the chief operating officer should know and insist that his motive power department and his fuel department work constantly in harmony in matters relative to fuel consumption, and that both have an equally full appreciation of what the fuel item means. The design and condition of locomotives and locomotive parts have such a direct and great bearing on fuel costs that when a locomotive is faulty in design or condition the waste is enormous.

Having touched on some of the more important phases of what the general transportation official can do with reference to fuel economy, let us now deal with the part the division transportation official has to play. It is necessary that the superintendent display a lively, keen and intelligent interest, that he appreciate and make those under him appreciate what locomotive fuel means, the bearing it has on operating problems and costs, and the many possibilities of reducing operating costs, many of which have not yet been well developed, by watching and supervising closely the use and performance of locomotive fuel. If the superintendent, the chief man on the division, does not display this interest, and does not insist that those under him display this interest, the chances are that the subordinate officers and employees will show none or but little interest. Fuel is the biggest single item of his transportation expense, and beyond question the one in which there is the greatest chance of his making a large saving.

The superintendent has three men who, if good men and strong men and the right kind of men, can help him get results. These are the road foreman of engines, the master mechanic and the fuel clerk. In order that the road foreman may have time in which to make careful selection and attend to his other duties, the mistake of giving him too much territory to cover, too many engines to look after, or too many engineers and firemen to supervise, should not be made. He should be in such position that he is able to get away occasionally, at least once a month—more often is better—to visit other near-by railroads, to determine what they are doing. It is desirable that the division superintendent have his road foreman hold monthly fuel meetings at some convenient place and hour. These meetings if properly held, if the superintendent and the road foreman take great personal interest in them, if the attendance is voluntary, not compulsory, and if free and unrestricted discussion is allowed to be held, and employees are permitted to say exactly what they think, will stimulate considerable interest and be productive of much good, especially if, when attention is called by an employee to some bad or defective condition or some erroneous practice, steps are taken to remedy such condition or practice, and attention is called at a subsequent meeting to the fact that this has been done.

The second of the important lieutenants which the chief division operating official, the division superintendent, has to assist him in controlling coal consumption is the master mechanic. It goes without saying that unless engines are properly maintained, particularly as regards steam and boiler leaks, an enormous number of heat units will be wasted. The master mechanic, in order to promote transportation economy, should study the division operating problems, particularly those which have a bearing on tonnage, speed of trains, character of grades, length of runs, etc., in order that, by use of this knowledge, he may know that he has his engines adapted in the best possible and most useful manner to the class of service in which the engines are to be engaged, or to the districts on which the engines are to be operated.

The master mechanic should constantly study his power to determine what devices can be added to engines, and what changes of design or alterations can be made on engines for the purpose of making a saving in fuel, and when such changes or alterations have been found possible they should be made, regardless of the fact that such changes may, because of their first cost or future maintenance, result in increased expenditure for repairs to locomotives, provided such changes will cost less than the savings to be effected in the quantity of coal used.

The third valuable lieutenant of the division superintendent, and one who has been often overlooked or else not utilized to his maximum capacity, is the fuel clerk. The fuel clerk is responsible for the proper accounting and distribution of a large item of expense, but he has not heretofore, on many railroads, been encouraged or allowed to call attention to wastes in his department, which he is in a good position, or should be in a good position, to know about. A bright, intelligent and well-paid fuel clerk should, in examining and entering his reports, often be able to notice engines consuming an excessive amount of coal, engineers or firemen performing poorly in this respect, excessively large charges made by other railroads or other divisions of his railroad against the division which employs him. He can note whether engines are given the proper grade of coal for the class of service they are engaged in; he can observe whether engines are taking the maximum amount of coal at the end of the division or run nearest or farthest away from the mines from which the coal is bought, thereby making a saving in the length of haul of the non-revenue coal burned on the company's locomotives. The possibilities of this position are great.

There are two other important division operating officials who can be of material assistance in improving fuel performance, although they cannot be of as much assistance as the men previously mentioned, namely, superintendent, road foreman of engines, master mechanic and fuel clerk. These two men are the trainmaster and the chief despatcher.

The trainmaster, because of his numerous trips over the railroad, during which time he comes in personal contact with engineers, firemen, hostlers, coal tipple men, particularly those at outlying points, is in a good position to be on the lookout for and correct bad fuel conditions. The trainmaster has entirely within his control one feature of operation which has an extremely important bearing on coal consumption, namely, the movement of trains; that is, having trains move, and when once moving, keep moving, instead of constantly stopping and starting.

The chief train despatcher, through close watching of his trains and the work of his despatchers, can of course be of material help in keeping trains moving, but perhaps he can be of an even greater aid in the matter of good fuel performance by figuring out and assigning freight locomotives to regular crews rather than by pooling his locomotives. There can be no question, however, as to whether pooled or assigned engines burn the most coal. It is astonishing how often it can be discovered that divisions on which the engines have been pooled can be successfully run without any more en-

gines, and without, in the long run, any greater delay to freight, by having engines regularly assigned.

Discussion.—It was generally agreed that without the assistance and co-operation of the transportation and operating officials the best results in the economical use of fuel cannot be obtained. The divisional organization, as in use on the Chicago Great Western, was described. On that road the superintendent of each division is responsible for everything on his division. By this means he is in a position to insist upon all of his subordinates, whether in the transportation or mechanical department, doing what they can to save in the matter of fuel consumption.

The operating department or the transportation department can greatly assist in fuel economy by not making unnecessary stops for the trains. It was stated that the additional fuel used at stops amounted to from 500 to 750 lb. of coal. The time spent on side tracks, or any other delay along the line makes a material difference in the cost of fuel. The cost per ton per mile per hour will give a figure in which both the mechanical and transportation departments will be particularly interested. The location of water tanks with respect to grades is an important matter, and care should be taken that slow orders along the right of way should be removed as soon as possible. One member believed that in some particular cases it would be more logical to sidetrack a passenger train, allowing a heavy fast freight the right of way with an ultimate saving in fuel. Where periodic meetings are held for the discussion of fuel economy the transportation men should be invited and in numerous instances on those roads which follow this practice, beneficial suggestions have been obtained from these men. Water should not be carried too high in the boilers. Tests on a saturated steam locomotive have shown that an engineer carrying three gages of water consumed about 16 per cent more fuel than one who carried one and one-half gages of water.

D. J. Feeny, Illinois Central, described briefly the system of handling fuel on that road. The work is under direct control of the general manager. There is one general committee, three grand committees, and divisional committees.

The divisional committees report to one of the three grand committees and the three grand committees report to the general committee. The divisional committees hold meetings once a month, in which the transportation men are included, and as a result of this co-operation and organization, the total result for all divisions for one year was a decrease of 10 per cent in fuel used, with an increase of 7 per cent in tonnage. The cost of handling this fuel was 33 per cent less. Two instruction cars have been used on that road for the past three years with very good results, moving pictures being used in the educational work. The following savings were made over the three grand divisions during the past year:

Division	Freight service	Passenger service
1	23.86 per cent	3.66 per cent
2	9.91 per cent	2.89 per cent
3	17.8 per cent	17.5 per cent

It was believed practicable to build larger water tanks, and to interlock as many railway crossings as possible, so as to eliminate train stops. The despatchers can assist greatly by giving orders to the train crews at the regular stopping points where it is possible to do so.

The transportation department can assist greatly when ordering power by giving as much time as possible to the master mechanic to make proper repairs. In making up way freight trains the "set-outs" should be grouped at the head of the trains and bunched as much as possible. It has even been found of advantage in some districts where winds of high velocity are experienced through the day to operate the "call-trains" after sunset, as the wind would not be of nearly as high velocity and a larger train load can be handled.

CARE OF LOCOMOTIVES WITH RELATION TO FUEL ECONOMY

By A. N. Willsie
Chairman Fuel Economy Committee; Chicago, Burlington & Quincy

Much is expected of a locomotive. Every delay, every piece of careless or indifferent work on the part of the road or shop or roundhouse men, every neglect of attention of machinery wear, or boiler and flues allowed to become foul, all revert back to the coal pile.

The capacity of the boiler should be great enough to more than supply the cylinder volume, as an engine cannot be 100 per cent efficient all the time for several reasons, such as condition of fuel, which varies, due to weathering, separating slack from lump, also containing too much non-combustible material (sometimes due to lack of inspection); condition of water; condition of boiler and flues, due to not being washed or cleaned when necessary (often due to not getting into terminals or to enginehouse for needed attention); inexperienced firemen and men newly promoted to the position of engineer. The boiler repairs must not be neglected. The boiler is required to furnish steam for various accessories in addition to the cylinders, but this extra duty may be more than overcome by the saving of fuel, due to better combustion brought about by light charges of coal at a time, and the fire door being kept closed. The heaviest drain of all on the boiler, however, is furnishing steam for the air compressors.

Many times from 10 to 15 per cent of the entire coal consumed on a trip is used to generate steam which is used by the compressors. I hardly think this is realized. Air compressors should be equipped with the proper kind of strainers to protect the air intake. Arrangements should be made so that it is possible to lubricate the air end properly. This item is neglected on many roads, and with bad results.

The air compressor exhaust should be so located that the steam will not go directly up the stack, as when standing this creates a draft on the fire having the same effect as a strong blower, resulting in a great waste of coal. I believe every engine should be equipped with a two-way valve, controlled from the cab, so that the pump exhaust can be turned into the tank, when so desired. This takes all the draft away from the fire, if used when standing; and heating the water in tanks results in a saving of coal.

It will surely pay well to cover the steam pipes with a good insulation; but better yet, put as much of the pipe as possible under the boiler lagging. The cost of the heat lost from this source, considering coal at $2 per ton, is about $4 per year per engine. This does not cover all the loss, as condensed steam or water entering the steam end of compressors is much less efficient, ruins the lubrication, and in time more waste occurs because of cut valves, seats and pistons of the compressor.

Assuming that a boiler of an engine has 50 sq. ft. of exposed surface, which will be equivalent to about a height of 2 ft. on a 9-ft. fire box, steam pressure at 200 lb. and an average temperature of the air at 66 deg.; there will be a loss of 18,438 lb. coal, which, at $2 per ton, is equal to $18.438 per year per engine.

There seems to be a variance of opinion as to the losses due to the accumulation of scale in boilers. Some of the best authorities give the losses about as shown in the following table:

Loss of Heating Power Due to Scale
(Approximate)

Thickness of scale	1/64	1/32	1/16	1/8	3/16	1/4	3/8	1/2	5/8	3/4
Per cent loss of heating power	2	4	9	18	27	38	48	60	74	90

These figures are not considered absolutely accurate, as these losses are not found to occur in all boilers, because the whole of the boiler surface does not usually become covered;

still the loss is always serious, apart from the stresses set up in the boiler plates.

I have been unable to obtain any reliable data as to the percentage of loss due to soot in flues on locomotives, but my opinion is that the amount of soot that will adhere to the inside of a flue will cause as much loss of heating power as 1/64-in. scale on the water side of flue, or 2 per cent, and any ash accumulating in the bottom of flues causes still a greater loss, according to the area covered. The University of Illinois made three series of soot tests on a horizontal tubular boiler, each covering a period of five days. It was found that there was an increase in evaporation due to clean surfaces of 13 per cent, a decrease in coal burned per square foot of grate per hour, due to clean surfaces of 32.16 per cent, and a lowering of stack temperature, due to clean surfaces of 17.59 per cent.

Prof. Ordway, in the "Transactions of the American Society of Mechanical Engineers" (Vol. 6, page 168), shows that there are only two materials that rank higher than soot as non-conductors of heat. The first is loose wool; the second is live geese feathers. Asbestos is thirteenth on the list.

A boiler should be washed regularly, using hot water with a pressure of about 100 lb. Nothing is gained by trying to get too many miles out of an engine between washings.

A total leak of but one pint of water per minute represents a loss of 65,700 gallons per year; this at 5 cents per 1,000 gallons represents a loss of $3.285 per engine per year. One pint per minute is a very small leak, taking into consideration the leaks around tank, tank hose and injector overflows, etc. Another bad waste is carelessness in filling tanks; they often overflow to the amount of 100 gallons or more.

All steam leaks must be avoided. On engines in freight service equipped with train heating apparatus the steam valve in cab is usually cracked a trifle to allow some circulation, to avoid the line freezing up; this soon cuts the seat; then it is impossible to close the valve tight. On engines in this class of service I would suggest that a small by-pass valve be used, so that circulation may be possible with no injury to the main and reducing valves. The expense of grinding in the small valve will amount to practically nothing compared with the other valves. The main throttle must be kept tight, as a matter not only of safety but economy. All steam joints in the front end should be tested every thirty days. Leaks in front ends of superheater engines can be so bad that no superheated steam reaches the cylinders, yet the locomotive may work along, doing nearly as well as a saturated locomotive.

Arch tubes should be used in the firebox. This not only gives more heating surface, but makes it possible to get many more miles out of the arch brick. Arches supported on studs do not last nearly as long. The saving in coal by use of an arch is not all due to the arch itself, as by the use of an arch the fireman is compelled to do a better job of firing than he might possibly do were there no arch in the firebox.

The decks of engines must be kept tight; no opening should be allowed around pin hole or shaker levers and other places. A loss of 200 lb. per trip through such openings is very conservative with the average fireman. Tanks should be built so that coal will be kept within easy reach of the fireman. The manhole on tender should be as long as allowable, so that the water crane spout will fit. Even if engine is not spotted directly opposite, this saves delay, which saves coal; also saves water and time filling the tank. It the tank has a small manhole and the engine does not stop in proper position to take water there is a delay, and steam is used moving train forward or back.

Roundhouses and their surroundings, such as good coal chutes, clinker pits and turntables, all go to help maintain the engines and save coal. If the engine cannot get into the house it cannot be given proper attention, especially as to flue cleaning. The stacks should be covered while in the house, to save heat and save flues, and the boiler will hold steam much longer. If an engine is kept in good condition it is not only possible for it to do better work, but it encourages the engineer and fireman to do better work.

The engineers, firemen, trainmen and despatchers, shop men and roundhouse forces, the chief despatcher, yardmaster and roundhouse office must work together. Avoid all the terminal delays possible, giving the mechanical department the benefit of every hour allowable to put engines in condition. Have an understanding as to when the engine will be needed, as the mechanical department can often take advantage of this time to do work which could be put off, but which would be more expensive later on, and in the meantime more coal would be used.

The general officers, both operating and mechanical, should do everything possible to get good roundhouse facilities and terminals, otherwise the engines cannot get the care they need. Delay in getting to the house is often caused by coal chutes, clinker pits and turntables being inadequate. The roundhouse is sometimes too small and not properly lighted or heated, and the stalls so short that engines cannot be placed inside and doors closed. Poor steam and air plants and tools all go to prevent proper maintenance, consequently a loss of fuel. The operating department should not order engines until they are needed, and then should get them over the road in the least time possible, according to the work required of them.

Tying up of crews on account of the 16-hour law is mighty bad on maintaining power in good condition, and results in a very great waste of coal. The coal burned while the engine is being herded accomplishes nothing in the way of hauling freight; then when put in service again the fire is not always in good shape, and the flues are worse; the crew are not always thoroughly rested, on account of poor accommodations, with the result that good service is difficult to obtain. Engines can be overloaded and worked beyond the economical point of combustion, resulting in heavy maintenance and also waste of coal.

According to the Interstate Commerce Commission report for the fiscal year ending June 30, 1915, $249,507,624, or about 23 per cent of the transportation expense of steam railways in the United States, was spent for locomotive fuel. From this it is plain that everything possible should be done to help save the coal pile.

Discussion.—Considerable stress was laid upon the necessity for maintaining the locomotive, and especially the air brake equipment of the cars, in proper condition. Applying the figure of $.00015, given by Mr. Willsie in his paper as the cost of fuel for air leaks per car mile with an 8½ in. compound pump, to the total revenue car mileage in the year 1914, shows that over $3,000,000, or about 1.3 per cent of the total fuel bill, was spent in this way. It was also pointed out that by keeping the air leakage down it was possible materially to increase the length of trains, especially on the mountain grades. The men in charge of the fuel economy should make it a point to see that the power is properly maintained, and thereby assist the engine crews in making a good performance in the use of fuel. The use of pyrometers on superheater locomotives was strongly recommended as a device that would soon pay for itself due to the fact that the condition of a locomotive can be more accurately determined.

COAL DISTRIBUTION RECORD SYSTEM

By J. G. Crawford.
Fuel Engineer, Chicago, Burlington & Quincy

Coal deteriorates more or less rapidly while standing in cars. Considerable trouble is experienced with subbituminous coals (commonly called "lignite"), containing 20 per cent moisture, on account of the cars not being unloaded in order of the date of billing from the mines. The follow-

ing system was designed to keep an accurate record of this coal and insure its being used in order of billing. The division on which this system was adopted begins at Edgemont, S. D., 232 miles from the billing station. Each unit of the system will be taken up in order.

Form 1.—This is used by the billing agent in notifying the despatcher of the cars which have been sent to his division No information except the car number, initial and the grade

FORM 1—DAILY REPORT OF LIGNITE COAL BILLED TO ALLIANCE DIVISION

Alger, Wyo.,.....191..

Mr.....
Chief Despatcher,
Alliance, Nebr.

Dear Sir:

The following cars of locomotive coal billed today to Alliance Division:

	Grade				
Edgemont					
Crawford					
Alliance					
Whitman					
Seneca					
Halsey					
Broken Bow					
Ravenna					

Yours truly,

Note: Size of this form is 8½ in. by 10¾ in.

of the fuel is shown on this form. On receipt of Form 1, sent by the forwarding agent, the chief despatcher makes out a card, Form 3, and shows thereon the car initial and number. Form 2 is for use of the agents at stations on the Alliance division, where the coal is unloaded. The instructions already printed on this blank describe this form sufficiently well.

FORM 2—DAILY REPORT OF COMPANY LIGNITE COAL FOR LOCOMOTIVE USE

.....191..

Report of Locomotive Lignite Coal for 24 Hours Ending 5:00 p. m. Date

Unloaded	Forwarded		Received	
Set at Stationary Plant				

INSTRUCTIONS COVERING THIS REPORT

The object of this report is to enable a complete record of all "lignite" coal to be kept by car numbers, and care should be taken to make sure that numbers are correctly reported, so it will not be necessary to wire for corrections.

(1) Covers all "lignite" coal, originally billed for "Locomotive Use," to points on the Alliance Division.

(2) Under heading "Set at Stationary Plant" are to be shown cars in the process of unloading at the stationary plant. They are to be reported daily under this heading until they have been unloaded, and are then to be reported under the heading "Unloaded." This does not apply to "Pea," "Nut Run," or other grades of coal billed for stationary boiler use, and applies only to cars billed for locomotive use, which have been taken for stationary boiler use.

(3) Is in addition to the present reports.

(4) Is to be mailed so as to reach Alliance on No. 43 and No. 44 on the day following that covered by the report.

(5) Is to be made daily, including Sundays and holidays.

(6) Keep a carbon copy.

(7) Only the initials and numbers of cars are to be shown.

(8) When cars are diverted off the Alliance Division, show destination under heading "Forwarded."

INSTRUCTIONS COVERING THE UNLOADING OF COAL

Unload the oldest cars first.

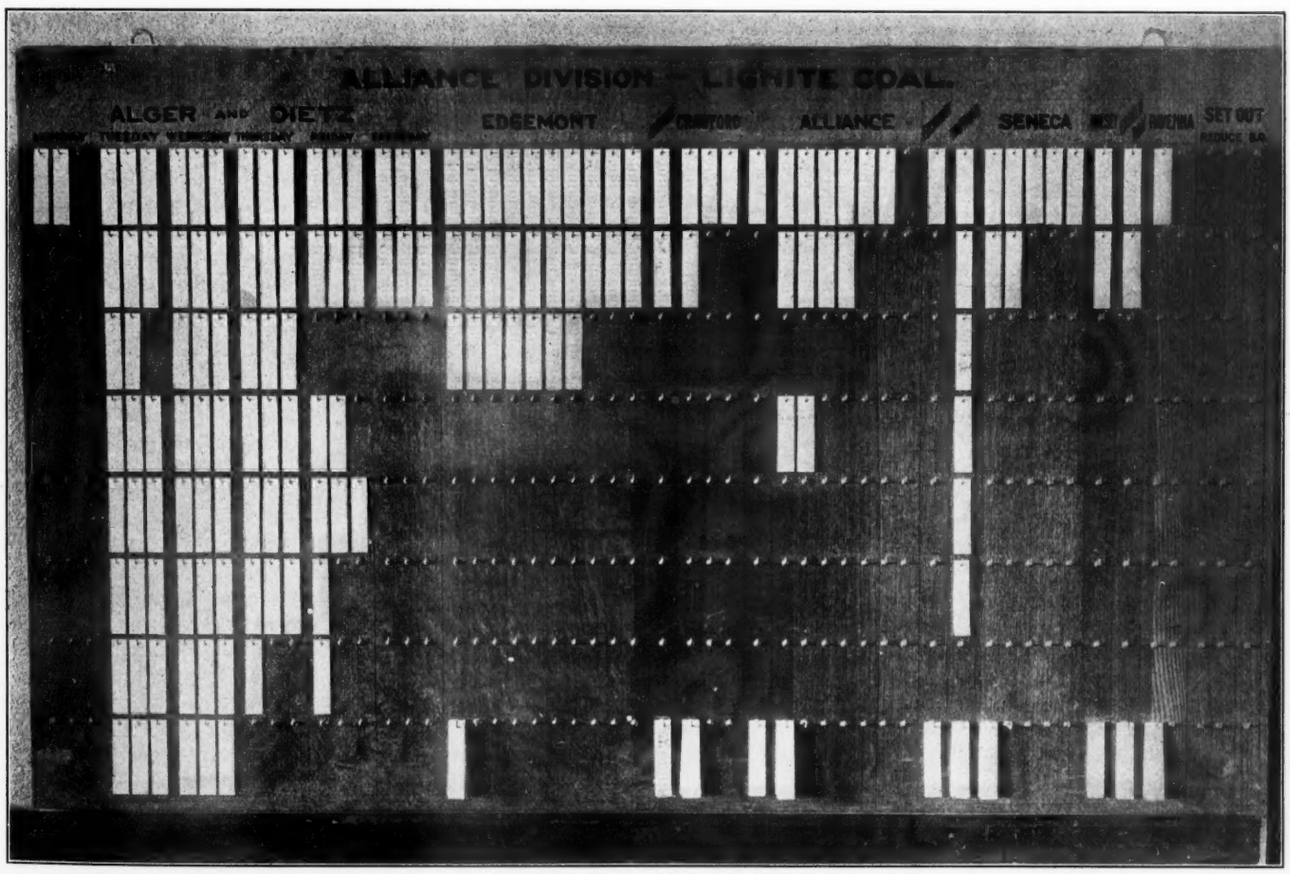
Unless otherwise advised divert the newest coal at your station.

Age of coal is to be determined by the date of the original waybill, and not by the date of receipt of the car.

OFFICE OF THE CHIEF DESPATCHER,
ALLIANCE DIVISION.

Note: Size of this form is 8½ in. by 10¾ in.

Form 3 shows the cards used on the coal record board. (a) is the blank card. (b) is a card covering Q-84196, lump coal (denoted by "L" in upper right-hand corner) applied on mine run order billed from Alger January 2 to Seneca (denoted by "X" before Seneca), into Edgemont January 6, into Alliance January 8, into Seneca January 10,

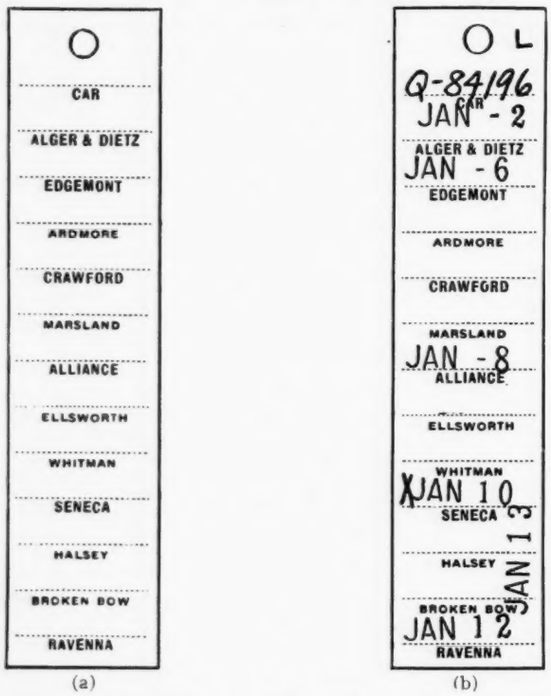


Size of board: 5 ft. 2 in. by 3 ft. 6 in.

Fig. 1—Record Board for Coal Distribution System

into Ravenna January 12, and there unloaded on January 13.

Form 1 furnishes the information for starting a card by the chief despatcher's clerk. Having filled out all cars with the car initials and numbers, he then stamps each card with a dating stamp, showing the date the car leaves the billing station (in these cases shown as Alger and Dietz, Wyo.). In addition a letter is used to designate lump or egg coals applied on the mine run order and an "X" ahead of the proper station to denote original billed destination. These cards are then hung on the board under the day of the week on which the cars are billed, which makes it easier for them to be found when they are reported having reached the Alliance Division. The cards are printed in yellow, white and blue, and are used to designate period of billing as follows: Yellow from the first to tenth of the month, white from the eleventh to twentieth of the month, and blue from the twenty-first to last day of month, inclusive; thus the length of time a car has been on track is indicated approximately by the color of its card. For example, on the nineteenth of the



(a) (b)

Cards for Coal Record Board

month there should be only yellow and white cards on the board. Any cars represented by the blue cards should have been unloaded several days prior to this date.

Fig. 1 shows the coal record board. The board provides space to hang 421 cards. Six columns, each representing a working day of the week, are provided under the head of "Billing Station." Each coaling station is provided with hooks in accordance with the amount of coal liable to be in the yard at that station. Columns for cars set out to reduce tonnage and on account bad order are provided. At the bottom and at the left-hand of each coaling station column a hook nearly two inches long, which will hold all cards covering cars which have been unloaded for several weeks past, is provided. These are called the "dead hooks," for when a card reaches this hook it is of no further use in so far as this record is concerned.

It takes from fifteen to twenty minutes each day of the despatcher's clerk's time to operate this board, when consumption is from 600 to 800 tons, and he proceeds as follows:

As the coal moves from west to east or left to right, as shown on the board, he works the board from right to left. The report of the easternmost coal chute is taken, and cards representing cars unloaded are stamped along the right side (to indicate unloaded) and moved to the dead hook. Cards representing cars received at that station are stamped to show the date of receipt, and moved to that column. The procedure for all other coaling stations is similar to this. The column on Form 2 covering cars "Forwarded" is not used by the despatcher's clerk, except in case he wishes to trace a car or verify a number. It should be noted that there is no writing on the part of the despatcher's clerk, other than filling in on Form 3 the numbers of cars forwarded from the mines on each day and the "L" or "E" (Egg) and "X." All other work on his part consists of using a rubber stamp which is set to the date of the preceding day. A mistake in car number cannot pass unnoticed unless at least three mistakes of the same kind are made, for at the westernmost coaling stations there would be a forwarding report from the billing agent and a receiving and unloading report from the westernmost coaling station, and unless all three were the same the error would be found. A card cannot be removed from the board without the despatcher's clerk knowing it, for on receipt of a forwarding or unloading report covering this car he would find that he had no card to cover.

Discussion.—The system described in Mr. Crawford's paper was devised for roads having no fuel department, and it has been in successful use on two divisions. It can be easily used on any road where the coal is handled by the chief despatcher. T. Duff Smith, of the Grand Trunk Pacific, stated that that road used the card system for handling lignite and sub-bituminous coal, which was found to deteriorate rapidly in storage. By this means this coal was put into service much quicker than if any other system was followed.

THE HUMAN FIREMAN

By Ralph Bradley
Inspector of Fuel Service, Boston & Maine

There are two big problems in the efficient operation of the motive power department of a railroad—the "mechanical" and the "human" problem. In the mechanical problem we find that the machine (let us say a locomotive or an automatic stoker) has no initiative; it will not run itself, but power must be generated and furnished from some separate source. With the man (let us say a fireman or an engineer), however, it is a different problem. Initiative or power is a part of him and cannot be supplied from the outside. It is a man's will and mind and nervous system which provide the power to make him do the work, and the adequacy of this impelling force and its transmission to the physique is just as necessary to the man as the power is to the machine. Just as careful specifications, examinations and tests should be made covering mental and nervous processes of employees in engine service, as are made covering the generation of mechanical power, and the sooner such steps are taken the sooner will a great light be shed on the mystery of the "human equation."

We hear it said that men are not the "same class" today as they used to be. There are just as many good men as before if you want to get them. If we do not get them, it is because we do not attract them, which is not their fault, but the fault of the job or the fault of the employer.

Why should not the new firemen be examined as to their mental and nervous qualifications? It is the mental traits and dispositions which are the essential ones. The mind and nervous system lie beyond and control the action of everything which the surgeon examines. If the fireman is accepted after examination only by the doctor, would it not be similar to the purchase of a machine having a power plant

attached, without any consideration being given to the nature or adequacy of the power?

Theoretic training, though not indispensable, should be given greater prominence than heretofore, if 100 per cent efficiency is to be approximated. Assuming that the candidate for fireman is chosen or at least held as a student, he should be trained in theory. The fact that he is not a high school or a university graduate, and probably has small appreciation for theory, is no reason why he should be spared the work of learning important theories. The normal man has the curiosity instinct, which we have all inherited from our savage ancestors. If you do not tell him the "why" he is very apt to work out some theory of his own, with extraordinary results. The ordinary run of men are more inclined to absorb through oral instruction, visualization and practical demonstration than by literature. For this reason it is difficult to conceive a more practical and efficient method of imparting theories than by the use of the lecture and demonstration car.

Whereas theoretic training is to explain *why*, practical training is to explain *how*. Practical training of a new fireman is indispensable, and specially so at the very start. It is far more important that the fireman should habitually strive to keep his fire as light as is consistent than that he should grasp the scoop in this way or that. It is far more important he should habitually study the condition of his fire and strive to place each scoopful of coal on that part of the fire bed where it will do the most good than that he should fire according to some system. The best practical training to fit a fireman to meet the variable conditions always present in locomotive operation is on the deck of the engine in the midst of those variable conditions.

The first five trips of the new man on the engine are his habit-forming trips; they are more important in their effect on the direction of his habitual attitude toward his work and toward the welfare of the company, and in their effect on his sense of duty and responsibility and on his character than any other five trips of his life. Not every road can afford to carry enough road foremen or assistant road foremen or fuel supervisors (call them what you will) to accompany each new man for five trips, nor is it necessary; but no road should under any circumstances permit a new man to make his student trips with any but the very best engine crews on the division.

The fireman should be required to pass a series of progressive examinations dealing with questions pertaining to both theory and practice in locomotive and train operation. At the same time he should be required to pass a physical and mental examination under a specialist, particular attention being given to a test of both sight and hearing. It is not until such tests and examinations have been made, and the result combined into some compact and readily available form, that a railroad can claim to have inspected the condition of its firemen with any degree of completeness.

Unless supervision and inspection under service conditions is much closer than it has been in the past, countless opportunities to commend efficiency and criticize inefficiency will continue to be lost, and with the same effect. The individual fuel performance statement, either with or without bonus, provided it is thoroughly reliable and gives credit for all the many factors entirely beyond the control of the fireman, is an excellent method for encouragement; but unless the fireman has the utmost confidence in the accuracy and fairness of the figures, even though the man who orders their compilation thinks them perfect, the statement fails to encourage, and may even discourage. It is an indisputable fact that the least laborious and most economical way to fire a locomotive is according to correct principles.

A series of interesting tests was conducted by two large eastern railroads, covering this feature of the subject. On each road a careful record was kept of the fuel performance of ten firemen on a number of trips under similar conditions. On part of the trips the firemen were unaware that they were under observation, whereas on the balance of the trips the test conditions were apparent. The following results in fuel consumed, expressed in percentage, were obtained:

Average of test trips, Road A	100
Average of test trips, Road B	100
Average of service trips, Road A	131
Average of service trips, Road B	133

For one reason or another, the variety of duties which a fireman used to be required to perform has been reduced in number, so that today the fireman has as his particular job but one object—to maintain full pressure and to make the fuel supplied to the firebox evaporate into steam as much water as possible. As expressed by President Buell, "There is nothing more discouraging to a good fireman than an engine that will not steam properly. But a poor steamer seems to have some hypnotic effect on a poor fireman or a new man that not only causes him to forget everything he has ever known or heard about correct principles of firing, but suggests that he is no longer a fireman, but merely a coal heaver —and he acts on that suggestion." If the co-operation of the fireman is desired, co-operation must be given.

Discussion.—In the matter of hiring men for the position of locomotive firemen, it was believed that too much care could not be taken in selecting the right kind of men. The hiring should be done by experienced men, such as road foremen, master mechanics, etc., and a record should be kept of applicants most suitable for the work so that they may be called upon on short notice. The new men should be required to work in the roundhouse a sufficient time to familiarize themselves with the work required to be done on a locomotive. The locomotives should be maintained in proper condition, for a poor steaming engine will discourage the engine crew in making any attempt to save fuel. Instruction books and reading matter, if properly handled, it was believed would be of considerable assistance to the firemen. Only by treating the men in a fair, intelligent way is it possible to obtain the proper co-operation.

FRONT ENDS, GRATES AND ASH PANS

The Front End.—The taper stack seems to be the most generally accepted design. Many previous experiments have shown that this form is somewhat more efficient and also more "flexible" than the straight type. The exhaust jet acts to move the gases by frictional contact, and by enfolding and entraining them, and hence it would seem logical to make the travel of the jet in the front end as long as possible. In other words, the highest stack with the lowest exhaust base should be the best combination. In place of the petticoat pipe the extended or drop stack is employed, with a generous flare at the bottom, and run as high above the nozzle as can be done and still clean the table plate. With this plan we do not believe that "over-draft" is necessary or desirable.

The committee wishes to go on record as decrying the use of bridges or splits in exhaust nozzles. Any bridge or split increases cylinder back pressure, and hence is undesirable.

In general, it might be said the taper stacks are desirable; the lowest possible exhaust base should be used; the adjustable petticoat pipe should be discarded; maximum netting area should be employed; bridges or splits should be avoided; "over-draft" should be eliminated, and the only adjustment (if any) should be made with the diaphragm apron.

Grates.—The grate is the mechanical supporter of combustion, just as oxygen is the chemical supporter, but nothing like a proportionate amount of study has been given to it. Material and design have generally been on a more or less haphazard basis. There is no limit, from a combustion standpoint, to the air opening which could be permitted to advantage. We should endeavor to obtain as large an amount

of air opening, evenly distributed through the grate bars, as can be done without mechanical loss of fuel. One road is, to our knowledge, experimenting with a grate of the non-interlocking, cross-rocking, finger type, in which an air opening of slightly better than 50 per cent is obtained. Besides improving combustion by reducing the restrictions imposed on the flow of air to the fire and distributing it more evenly throughout the fuel bed, we may expect a reduction in clinkering.

The material used in making grate bars should be cast iron of maximum strength commensurate with toughness, small shrinkage and high melting point. The committee recommends the following analysis for the cast iron from which grates are to be made:

Silicon	1.20 per cent to 1.40 per cent
Phosphorus	Not over .50 per cent
Manganese	.75 per cent to 1.00 per cent
Sulphur	Trace to .10 per cent

Experiments with a mixture approximating the above have been made with good results, although they have not been carried far enough as yet to give any comparative figures.

Ash Pans.—The committee recommends the largest possible amount of ash pan opening with a minimum of one square foot of opening for each seven square feet of grate area, or a percentage of about 14, this holding for bituminous coal. For anthracite, 50 per cent of the above ratio may be used.

Ash pan volume should be as large as consistent with the design of the locomotive, and not less than 1.25 cu. ft. for each square foot of grate area.

General.—The heat loss in the furnace offers a great field for investigation. Heat is lost here, first, by sparks and cinders; second, by the escape, unconsumed, of certain CH_4 series hydro-carbons; third, by CO; fourth, by combustibles through the grates, and fifth, by radiation at the grate. The committee believes that the most efficient furnace design can be reached by the use of large grate areas, by large combustion chambers, and by allowing the admission of plenty of air through grates and ash pans. An excess of air, obtained without restriction, is a prime necessity for perfect combustion, and it is not believed that, within reason, it exerts a deleterious effect on firebox temperature and evaporation. The velocity of the gases through the tubes has an important bearing on the capacity of evaporation of the tube heating surface. Other conditions being equal, the evaporation increases almost directly as the velocity of the gases increases, while the efficiency decreases but very little after the point of critical velocity has been reached.

The report was signed by: M. C. M. Hatch, chairman (D. L. & W.); Ralph Bradley (B. & M.); E. B. De Vilbiss (Pa. Lines); W. F. M. Goss (Univ. of Ill.); H. B. McFarland (A. T. & S. F.), and J. P. Neff (American Arch Company).

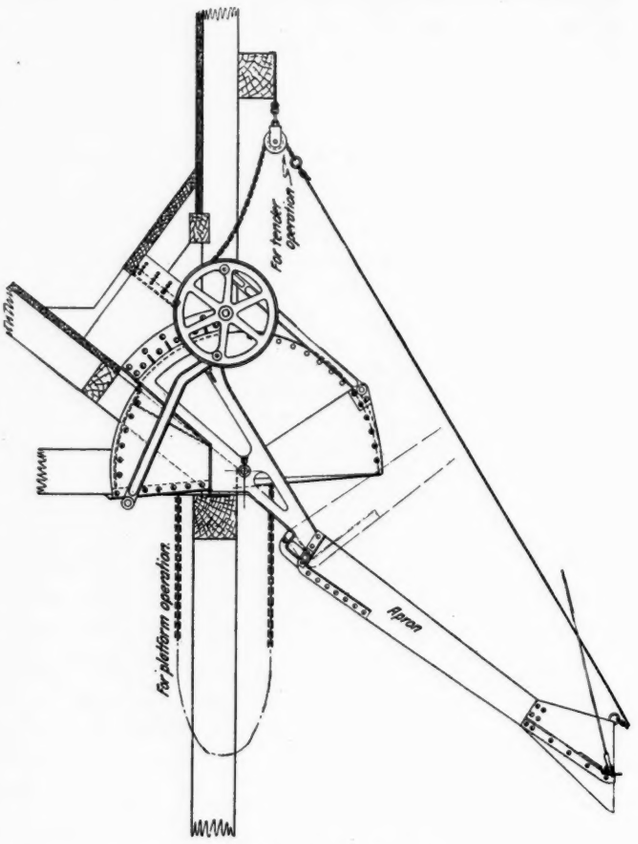
Discussion.—L. R. Pyle, of the Minneapolis, St. Paul & Sault Ste. Marie, called attention to the fact that some of the states are requiring a legal standard for the size of openings and size of wire for the front end netting, in order to reduce the liability of live sparks passing from the locomotive, setting fires along the right of way. He stated that the oblong mesh gives a better result than the square mesh in that the cinders are broken up to a greater extent before leaving the front end, and at the same time it gives a greater percentage of free opening permitting the use of a larger nozzle. Tests have shown a decrease of six per cent in the amount of steam used to do the same amount of work after the nozzle tip had been enlarged 5/8 in. in diameter, which was due to the reduction in back pressure in the cylinder.

FUEL STATIONS

At the last meeting of the association, it was suggested that some reliable automatic means and devices might be cheaply installed, operated and maintained; not only on new plants being installed, but also to plants that are in operation; and also that certain devices might be developed to provide automatic and reliable record of the actual amount of coal issued by each plant to each locomotive and engineman. At that time, reference was made to a certain device for weighing and measuring coal, and since then the committee has endeavored to urge all manufacturers to complete their studies and plans, and we are submitting the results of the year's work.

Design A

This measuring device consists of a square box holding a full ton of coal. At the back of the box is located a curved undercut gate to cut off the flow of coal between the coal pocket and the measuring device. The front of the box is closed by means of a gate hinged at the top; both openings in the box, front and rear, are of ample size to allow the coal either to escape quickly or to flow into the box quickly,



Coal Measuring Device

whether small or large coal is used. The two gates operate alternately—that is, when the back gate is open, allowing coal to flow from the pocket into the box, the front gate is closed, and *vice versa.* Both gates are positive in operation, and the device may be operated either by hand power, by electric motor, air, steam or other power. An apron is hinged to the bottom of the box at the front in such a manner that it may be swayed from side to side. This distributes the coal evenly over the tender without moving the locomotive.

The workable cycle of operation of the measuring device has been found to be four measures or tons per minute when operating by power. If operated by hand the number of measures per minute would be reduced.

The measuring device is provided with a revolution or cycle counter, registering one ton for each cycle of operation. Each fireman on the arrival of his locomotive at the coaling station records the number of tons shown on the counter. He then takes as many tons as he requires and records on

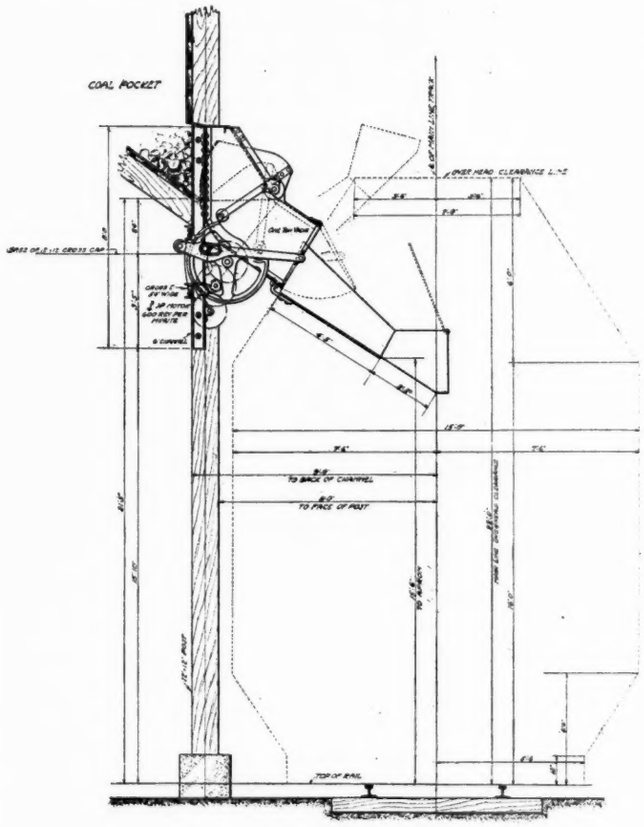
his ticket the final number of tons as shown by the counter. The difference between the two records indicates the amount he has received. By this method each fireman's record is a check on the one preceding and the one following his locomotive.

This measuring device has been designed with the object in view of its being attached to existing structures without any appreciable alteration to them. It has also been designed to conform to standard track clearance lines.

Design B

This measure is constructed in such a manner that it can be attached to the present stations without loss of elevation or standard clearance, as there is no change in the main slopes of the storage bin floor. The only change necessary is the side slopes and an additional small baffle over the measure, which can be changed at a nominal cost.

The measure is of half-cylinder design, pivoted in the



Device for Coaling Stations

center, with a gate at one end and a cut-off at the other. The bottom is provided with an additional plate extending from the cut-off to the center or pivot, and is located so that it continues the slope of the bin floor when in a filling position, also providing a very steep slope when the measure is in a discharging position, causing a quick delivery of the coal. The main bottom of the measure extends beyond the cut-off plate, and forms a pocket to catch the fine coal that might pass by the cut-off. All coal caught in the pocket is passed to the measure when discharging through the opening under the cut-off. The measure is held in position by a pivot shaft which is attached to the bottom and passes through the two steel side castings, these castings being securely attached to the building at the pivot and upper end. The lower end of the side castings is provided with a cross-connection, and attached to same is a hinge or pivot to support the delivery spout.

The measure is operated through the link connections by rotating the sheave wheels, the links forming a toggle as the pivots pass over dead center, holding the measure in a locked position until the wheel is rotated by the operator. The measure is counterweighted sufficiently to cause it to return to the filling or horizontal position. The coal flowing into the measure causes the center of gravity to change to the front or discharging position, and it will immediately tip and discharge the load when unlocked, by rotating the wheel out of the toggle position. In the discharging of the coal or returning to a loading position, the link connection to the rotating wheel eliminates all slam or shock to the measure, as the movement is gradually reduced as the links pass over dead center. When the coal is discharged the measure automatically returns to the filling position and is again locked by the toggle links. The operation of the measure is produced by a slight pull on the rope or chain to rotate the wheel causing the link pivot to pass dead center, the weight of the coal causing the measure to tip.

The capacity of the measure is one ton, and the movements are about eight to the minute. Attached to the measure is a recording device which records each issue to the engine, also a total record of the amount of coal passing through the chute. The measure is simple and strong in construction and cannot get out of order, and can be operated by hand from the tender or a platform, or power can be attached when desired.

The report was signed by: H. J. Slifer, chairman (Cons. Eng.); E. E. Barrett (Roberts & Schaefer Co.); H. B. Brown (Ill. Cent.); W. E. Dunham (C. & N. W.); J. C. Flanagan (Fairbanks-Morse & Co.); G. W. Freeland (Williams, White & Co.); W. T. Krausch (C. B. & Q.); R. A. Ogle (Ogle Const. Co.); J. L. Rippey (C. M. & St. P.), and A. Warner (Link Belt Co.).

Discussion.—The moral effect of weighing the coal on the tender of a locomotive was believed to have a very beneficial effect on the engine crew. Tests have shown that where the enginemen know that they are being checked on the amount they use, a 10 per cent saving will result. It also serves to keep a more careful check on the condition of the locomotives. There was some disagreement regarding the measuring of the coal by volume as against obtaining the true weight of coal used. It was pointed out, however, that the volumetric devices could be adjusted for the different grades of coal used, so that the error would be slight. Tests on the type A machine shown in the paper, which was installed April 7 on the Nashville, Chattanooga & St. Louis, and had distributed 4,623 tons, showed that there was less than one per cent error per ton.

It was believed as necessary to weigh the coal into the coal chute as it was to weigh it out, as by this means a more definite check can be obtained on the coal used. In making adjustments for the overage or shortage, it was believed far better to adjust through a profit and loss account rather than to apply a correction to each individual engine, as it was much fairer to the engine crew.

A device for measuring the coal on the tender was mentioned by M. C. M. Hatch, of the Delaware, Lackawanna & Western, which was in the process of experimentation. He believed that this system would be of material advantage in that the men could constantly be informed as to the amount of coal they are using throughout the run. This device is such that the coal container in the tender is supported on diaphragms which are supported by a fluid. The pressure of this fluid is registered on gages which show the weight of the fuel container.

OTHER BUSINESS

A paper was also presented by A. G. Kinyon of the Powdered Coal Engineering & Equipment Company on the "Influence of an intimate knowledge of coal on fuel economy efforts of enginemen and others." Mr. Kinyon performed practical experiments showing the constituents of coal and

how they may be burned efficiently. Progress reports were submitted by the committees on Fuel Tests, Fuel Accounts, and on the Storage of Coal. The committee on Fuel Tests reported that about $2,000 has been obtained for the purpose of conducting tests at the University of Illinois testing plant, and the committee had been assured of co-operation of the University of Illinois and the United States Bureau of Mines.

The secretary-treasurer reported a total membership of 636 and a cash balance of $1,940.11 up to May 1, 1916. During the convention 68 new members were enrolled. The proportion of attendance at this convention to the total membership was greater than ever before in the history of the association.

The following officers were elected for the ensuing year: President, W. H. Averell, general manager, New York properties, B. & O.; vice-presidents, E. W. Pratt, assistant superintendent of motive power and machinery, C. & N. W.; L. R. Pyle, fuel supervisor, M. St. P. & S. S. M., and W. L. Robinson, supervisor fuel consumption, B. & O. The following were elected to the executive committee: for two years—A. N. Willsie, C. B. & Q.; T. Duff Smith, G. T. P.; R. R. Hibben, M. K. & T.; Ralph Bradley, B. & M.; C. M. Butler, A. C. L.; for one year—William Schlafge, Erie, and W. K. Kilgore, C. H. & D. Chicago received the largest number of votes for the next place of meeting.

REPORT ON SOUTH CHENEY COLLISION

The Interstate Commerce Commission has issued a report, dated April 8, and signed by H. W. Belnap, chief of the Division of Safety, on the rear collision of eastbound passenger trains on the Spokane, Portland & Seattle at South Cheney, Wash., on the morning of February 20 last, when five passengers were killed. Both of the trains belonged to the Northern Pacific and were being run over the S. P. & S. because of washouts on the Northern Pacific. The leading train was standing at the station and had been there about three minutes when the other one came on at excessive speed. A coach at the rear end of the standing train, one having a steel underframe, was pushed halfway through a wooden sleeping car next ahead of it.

There is no block system on this line. The trains had left the last preceding station, ten miles back, from seven to ten minutes apart; seven minutes according to some of the testimony, and ten minutes according to the station operator, and the second train had run faster than the first one. Because of imperfect track, and for other reasons, there was a standing order that the speed of all trains between these stations should be limited to 30 miles an hour; but, after weighing a good deal of conflicting testimony, the inspector concludes that the second train had been run at 40 miles an hour or faster.

The flagman of the standing train had got back somewhere from 200 ft. to 900 ft. He had thrown off several fusees and the report says that he evidently had been fully awake to his responsibilities while en route; but there was considerable fog and the fusee which he carried as he ran back was not seen by the engineman of the following train in season to be of any use. The report holds that he should have thrown off a fusee as he approached South Cheney, on account of the dense fog prevailing. This he did not do, and this is deemed a contributing cause of the collision. The testimony as to the density of the fog is confusing, one witness having seen the flagman from a distance of 1,000 ft.

Both trains had train orders giving them right to the road only to South Cheney, and this is held to have been another reason why the second train should have approached that station under control. The inspector is unable to decide whether or not the operator at the last preceding station, Amber, held the second train ten minutes after the passage of the first.

The report, in conclusion, says: "This accident once more calls attention to the inadequacy of the time interval system of spacing trains. . . . With the long distances between telegraph offices, especially at night, a train traveling at a high rate of speed may overtake one traveling at a low rate of speed, and this makes advisable the adoption of the block system."

These Northern Pacific trains were running over a foreign road without pilots, but they had been running there several days—and freight trains of the Northern Pacific were regularly using the Spokane, Portland & Seattle eastbound between Pasco and Spokane, 146 miles—and the declaration of the Northern Pacific people that their trainmen were sufficiently well acquainted with the other line seems to have been accepted.

MANUFACTURERS ASK FOR SANE REGULATION OF CARRIERS

Correction of defects in the present system of governmental control over railways was urged in resolutions adopted on May 16 by the National Association of Manufacturers at its annual convention in New York.

The subject came before the association on petition of a number of companies which are members of the Railway Business Association as well as of the National Association of Manufacturers. This petition was initiated by Stephen C. Mason, secretary of the McConway & Torley Company, and a member of the general executive committee of the Railway Business Association. The petition points out the necessity of legislation to restore the energy and initiative of the transportation companies of the country. "As shippers all of us are suffering because the railways have not had the resources with which to prepare in advance for increase of tonnage. As seekers of new business our progress has been obstructed because the railways have not attracted capital for the development of new regions and the consequent creation of new centers of purchasing power. As Americans we have reason for grave anxiety lest the transportaiton system should prove inadequate for national defense. As citizens of individual states we are injured because one state conflicts with another in railway regulation; as citizens of the United States because state regulation interferes with federal regulation. The statute under which the Interstate Commerce Commission regulates railway rates is defective in that it provides for restriction only and not for protection to the roads."

This petition is signed by 56 memebrs. Following is the text of the resolution passed by the National Association of Manufacturers:

Whereas, National business, national development and national defense require the vigorous resumption of improvements, additions and extensions by our railways; and whereas, such resumption is obstructed by defects in the system of governmental regulation of railways; therefore be it

Resolved, That the National Association of Manufacturers urges Congress to exert its constitutional power of regulation over these instrumentalities of interstate commerce and thus unify regulation of railways to the exclusion of unfair intrastate jurisdiction where federal and state regulation conflict;

Resolved, That we favor legislation which will simplify the functions of the Interstate Commerce Commission and strengthen its organization, to the end that that body may delegate special tasks and regional administration to competent auxiliaries;

Resolved, That we urge Congress to enact as a provision of the interstate commerce law the rule that such rates shall be permitted as will yield the average road earnings sufficient to attract investment for the development of transportation facilities and for the opening up of regions not now served by railways.

Railways in a System of National Defense*

Requirements as to Special and Standard Equipment, Adequate Track Facilities and Discipline of Personnel

By W. L. Park
Vice-president, Illinois Central Railroad

THERE is a degree of preparedness for national defense the value of which appears to be recognized by all except an eloquent minority. What the enlightened thought of the people has determined to be essential is that the country should seek to secure itself in such position that if emergency arise it shall not be subjected to immediate defeat. But some of those who clamor loudest for those outward and visible signs of readiness, a strong army and navy, neglect consideration of equally essential fundamental preparations. An army and navy, unsupported by adequate transportation facilities, are merely a transparent bluff. The efficiency of a navy, though it were to outnumber the floating equipment of any other nation, is dependent upon a series of naval bases adequately maintained as to supplies. It is our boast—probably not well founded in fact—that we can quickly provide an army equal to any requirement. The preparation of a transportation system, upon which much of the efficiency of an army, large or small, depends, is certainly a work that requires time.

There is perhaps reason for congratulation that our railroad system as a whole has had its foundations so broadly laid. There is wanting, however, a vast amount of development with a specific purpose in view, before it could begin to fulfill its functions as a part of a system of national defense.

Germany's Transportation Facilities

Admittedly, Germany has reached the highest point yet attained in military efficiency. It has for years recognized the value of sufficient military facilities. To serve as a part of its military organization has been the prime consideration in the construction, equipment, organization and maintenance of its railways. The Army and Navy Journal† quotes from the results of a survey by a Dutch general of the development of the German railway system from a military point of view since the Franco-Prussian war. As early as 1870-1871 there were at the disposal of the German military authorities altogether 7 railway lines in Northern Germany and 3 in South Germany. Only one, that from Berlin to Cologne, had double track. Yet with these facilities it was possible to convey 16 army corps, an aggregate of 450,000 men, to the frontier in 11 days. Since then military authorities have never ceased in the development of the railway system on a strategical basis. The results are striking. Germany now has 12 double-track railways lying between Osnabrück on the north and Ulm on the south about 125 miles east of the Rhine. Every army corps normally garrisoned east of this district has a double-track railway at its disposal. The same facilities were also available for the reserve army corps formed at the time of mobilization.

No less than 18 double-line bridges were, at the time of the beginning of the war, provided for the crossing of the Rhine. Eight to ten cavalry divisions can be conveyed from the Rhine westward simultaneously with the army corps above referred to. Four brigades with the requisite contingent of cavalry and artillery require 96 trains. All of this number of trains could be despatched in the same general direction in 12 hours. It was thus possible in August, 1914, to effect the whole transport to the western frontier in about 20 hours. The transport of these troops began on the second day of mobilization, August 3, in the evening. It was completed at noon on August 4. During that night the frontier was passed. Liege was assaulted on August 5 and 6.

For the transportation of troops from the western to the eastern front 6 double-track railways were available. The distance from Maubeuge on the west to Konigsberg, just short of the Russian frontier on the northeast, is 994 miles. A military train ordinarily makes about 250 miles in 24 hours. This journey, then, occupied about four days. For the transport of 6 army corps of 40,000 men each a week was generally allowed. The transportation of this number of men required 124 trains and two or three days were consumed in the necessary preparation.

The limited amount of double trackage in this country would make impossible any similar movements except in a few sections of the country, for distances which, though absolutely as great as can be made within the whole German Empire, would be comparatively small when the extent of this country is considered. Nor would double trackage alone, even in Germany, have been sufficient to make the movement possible. The sufficiency of trackage is only one item. Its provision and the entire equipment and organization for its operation, even to a knowledge of what orders would be given under any set of circumstances, have been a subject of expert study and preparation there for 40 years.

During the last twenty months transportation facilities in England and France have been put to a severe test. Apparently they have served their purposes. The chairman of the London & Southwestern Railway stated in February, 1915, that the movement of military and naval organizations had involved up to that time the running of 15,000 special trains. He also said trains had always been ready for the troops and had arrived on or before schedule time. Because of its location the Southwestern has had a large share of this transportation; but several of the other lines reported at about the same date that they had operated from 3,000 to 8,000 special trains in this service. The British transportation service during this war has doubtless owed much of its efficiency to the arrangement entered into between the government and the railways under an act of parliament passed in 1871. The government board is in control of all railway service, but the actual operation in each case is by the railway's own officials.

In France the army took over the entire railway system, absorbing its personnel in the army under direct command of army officers.

The Need of Special Equipment

In the event of war, the transportation of heavy guns is an important factor. The extent of the special transportation facilities absolutely required is probably but little appreciated. The factories where the guns are made and repaired must be located at a distance from the place where their use is required. They must be transported to the firing line. The new 16-inch gun now being developed by the Ordnance Department of the United States army is looked upon with special favor by military authorities. It requires a special car for its transportation. The government does not own such a car, but has obtained the use of one through the courtesy of the Bethlehem Steel Company. The 14-inch gun

*An address before the International Association of Railway Special Agents and Police, New Orleans, May 25, 1916.
†April 10, 1915.

is transported on a 200,000-lb. flat car with an ordinary flat car serving as a trailer. Lt. Col. James E. Hoffer, of the office of the Chief of Ordnance, wrote on December 29, 1915, that there had been no difficulty in obtaining the use of such cars on short notice. This, however, is doubtless explained by the fact that there is no demand for such cars in quantity. Only two or three roads, according to the Official Railway Equipment Register for May, 1916, have cars of any class approaching this capacity. The Norfolk & Western has 750 gondolas of 180,000 lb. capacity. The Pennsylvania has about 120 flat cars of 150,000 lb. capacity. Most roads have no flat cars of above 50 tons capacity. The flat car of 200,000 pounds capacity that has been built is for the occasional transportation of heavy guns from the factory to the proving ground, and others approaching that capacity are, with the exception of the Norfolk & Western coal cars, which are in regular service, for limited service of a special nature.

Some of the requirements in the direction of special rolling-stock equipment are indicated by the weight and dimensions of certain of the larger guns constructed by the United States government for coast defense and general service. These are as follows, on the authority of Lt. Col. Hoffer:

Caliber	Weight, lb.	Length	Width
12 in.	132,000	42 ft	66.2 in.
14 in.	139,000	48 ft. 3 in.	66.7 in.
16 in.	284,000	49 ft. 3 in.	90.5 in.
*16 in.	367,000	67 ft. 2 in.	88.0 in.

*Figures relating to the new 16-in. gun are taken from the design, the gun itself not having been built at the date of Lt. Col. Hoffer's letter.

All 16-in. guns, therefore, will require for their transportation cars of a capacity of which none have been built except one in possession of the Bethlehem Steel Company. There is only a limited number of cars capable of being used for the transportation of 14-in. guns.

The significance of this lack of equipment can only be brought home by a consideration of the requirements of service in view of the short life of heavy guns under firing conditions. Col. B. W. Dunn, chief inspector of the Bureau of Explosives, American Railway Association, says the number of rounds that heavy guns can be fired before it is necessary to return them to the factory to be relined "depends upon the kind and quantity of powder used in the charge and also upon the action of the rotating band. It was thought some years ago that our most powerful 12-in. gun might not last over 75 rounds, but an enlargement of the rotating band gave so much better results that we now hope to see them last as much as 200 rounds. As a rule, the larger the gun, the shorter the life as measured by the number of rounds fired. My guess (I am quoting Col. Dunn) for the life of the new 16-in. gun would be from 150 to 200 rounds." In the same letter Col. Dunn gives the following information as to the rapidity of fire of these guns: "The only (16-in.) gun now built has not yet been mounted regularly on a carriage destined for it, and we have no data as to the rapidity of fire. A 12-in. gun on a similar mount has been fired as often as 30 rounds at the rate of two rounds a minute. It is estimated that the 16-in. gun can be fired, if desired, as rapidly as one round per minute and possibly faster."

There are 1,440 minutes in a 24-hour day. Under ordinarily favorable circumstances in a continuous action, offensive or defensive, from 8 to 10 guns per day would be required to give the service of one. That is, replacement of each gun—the removal of the exhausted gun and the placing of a substitute—would have to go on at the rate of one for every two and a half or three hours. And for this service between each point of action and the distant factory, the special equipment would be required. Contrary to the general supposition that a position strongly fortified with heavy guns can be supported by the use of those guns until the determination of the action, the foregoing statements indicate how short-lived a fortification must be without the requisite transportation facilities for the necessary relay guns.

The Requirement as to Standard Equipment

Adequate facilities are also essential for the transportation of ammunition. Henry Maxim, inventor of explosives, is quoted in a recent book, "War's New Weapons," as saying that "within a circle of 160 miles around Peekskill, N. Y., as the center, will be found 90 per cent of the arms and ammunition works, military stores, smokeless powder works, torpedo works, and torpedo boat works of the entire country."

It is about 2,500 miles in an air line from this center to the Pacific Coast and about 1,600 miles to the Rio Grande. Transportation routes are much longer. Either transportation facilities must be adequate to annihilate these distances without delay in the delivery of munitions to the various points where they may be of vital importance, or plants for the manufacture of such munitions should be located at points far in the interior. In the way of insurance, either provision or both would seem to be a not over-adequate measure of preparation for possible contingencies.

Transportation of wounded or incapacitated is as important for those still engaged as for the disabled ones themselves. In the British army transportation of the wounded is based on two principles: The maintenance of the mobility of the army by relieving the fighting troops quickly of all who have become non-effective; and the rapid removal of the latter into a region where the best skill and the most favorable conditions are available. Under some conditions this need can be met to a limited extent by the use of water transportation; but the capacity of barges drawn by tugs and such other limited water carrying transport facilities as may be available, as well as means of water communication itself, may be wanting or limited so as to render this adjunct negligible. The main reliance, under all but exceptional conditions, must be upon the available facilities for transport by railways.

It is trite to say that an army fights upon its stomach. But if the matter were analyzed in all its bearings, it would be difficult to determine whether supplies of ammunition for the guns or food and other necessities for the men themselves are the more important. But so far as the equipment of the railways of the United States is concerned, the transport of commissary supplies presents no difficulties that are not a part of the general railway problem, as is the case of the special equipment required for heavy guns. What is required for this service is sufficient rolling stock and terminal facilities, particularly facilities for rapid loading and unloading. The same facilities would be extremely serviceable in time of peace.

In addition to the fighting forces themselves, their heavy guns and ammunition for the light as well as for the heavier pieces, and the continuous service required for the bringing in of commissary supplies and the removal of the wounded or incapacitated, modern warfare as it has developed in its latest example demands a vast supply of equipment never before provided for. Motor power in every form has not only largely superseded the use of horses, but has been put to new uses. The Army and Navy Journal refers to motor plows as used for digging trenches. These plows dig trenches three feet deep and do it faster than a hundred men with shovels. Caterpillar tractors, familiar on the prairies of Iowa and Illinois, haul the heaviest siege guns. Searchlight wagons light the fields at night. Powerful trucks equipped with dynamos are used for charging wire entanglements. Motor aeroplane towing and repair wagons, as well as motor mail wagons, are extensively used.

Motor transportation may be considered as supplying the requirements of local service close to the fighting lines as adjuncts to the railways performing through service. There are available in accounts of events in the European war numerous records of the transportation of a considerable army over appreciable distances by means of motor cars. In

the earlier weeks of the war General Gallieni made a sortie from Paris in 4,000 taxicabs and small automobiles. Nine men were put in each. In six hours 70,000 men had been transported about 35 miles. An entire British army of 200,000 men was similarly transferred across country 170 miles in three days.

The significance of these facts in connection with a consideration of preparedness as relating to railways lies in the fact that this special equipment is not likely to be available in quantity at the precise points at which actions are taking place. Most of it must be manufactured at perhaps hundreds of miles from the place where its services are required. It is the function of the railways to serve as the means of transport between place of manufacture and point of use. The service is likely to be continuous in one direction or another so long as it may need to exist at all. In connection with the present war, the life of a horse has been estimated at about 30 days. The life of a motor vehicle, taking into account the forced mileage and rough handling, is probably not so great, at least up to the time that general overhauling and repairs are necessitated.

The use of motor vehicles is not confined to the requirements of the personnel. Backward as is the United States in any matter looking toward military efficiency, the use of motor traction is contemplated in connection with designs for a 9.5-in. howitzer which are nearing completion and designs for an 11-in. howitzer which are under way. The latter piece is expected to be mounted upon a special vehicle to be drawn by a motor tractor. One type of heavy howitzer has been recommended by the Chief of Ordnance to be mounted upon railroad trucks so as to be fired therefrom. Ordnance officers are quoted as having stated that in the future the size of the larger guns will be limited only by the means of transportation.

Col. Dunn has described one close connection made by the Germans between the army and the transportation lines in which the service of the latter is direct. According to the best information available, he says, the Germans have been using two types of 42-centimeter guns. The more powerful and heavier model is transported from place to place on a special car running on railway tracks. When it is desired to fire the gun arrangements are made for lowering the weight to a specially-built platform consisting of heavy bolted timber. This relieves the trucks of the weight of the gun so that the special car takes none of the strains due to firing. The projectile weighs 1,918 pounds and the maximum range is said to be over 9 miles. A type of howitzer of considerably lower power, with a range of nearly 5 miles, is transported by tractors over ordinary roads.

The statement that the size of guns and the extent of their use will be limited only by the means of transportation suggests two of the more important requirements of the facilities of transportation. These are in addition to the special equipment required for the 16-in. guns, as before described. Because this class of equipment is special, it should be the property of the government. Such cars in number sufficient to move all the larger guns to any distance and with any frequency required, should be at the service of the government at the place where the guns are constructed or where they, after construction, have been placed. They are suitable only for this class of loading. Railroads cannot be expected to look with favor upon the tying up of so much of an investment as would be required in making them a part of their regular equipment in view of the extremely indefinite frequency of their use.

The first general requirement is a sufficiency of equipment not only for the conveyance of troops and of ordinary supplies, but of such rolling stock as is adapted for the transport in quantity of the heavier items of military outfitting above mentioned, in addition to that which is necessary to carry on ordinary transportation service. The ordinary demands of transportation service cannot be left out of the account. In many respects the supply of rolling stock equipment fails to be adequate in times of peace. The special demands created by a condition of warfare would magnify this deficiency, at least locally. What would amount to a considerable surplus of equipment under ordinary traffic conditions would be quickly wiped out if the railways should be called upon to perform their essential functions as a part of a system of defense.

The accompanying table gives an idea of the amount of railway equipment that would be required in the event of mobilization and movement of various military units. The figures were obtained from the War Department by J. E. Baker, of the office of Vice-President and General Manager W. R. Scott, of the Southern Pacific, at San Francisco:

	Personnel					Railroad equipment required							
	Officers	Men	Animals	Vehicles	Guns, complete	Pullman	Coaches	Baggage	Box	Stock	Flat or gondola	Total cars	Trackage (ft.)
Infantry regiment	55	1,890	177	22	..	5	43	5	15	9	8	85	5,150
Cavalry regiment	54	1,284	1,438	26	..	8	28	8	25	72	9	150	7,850
Artillery regiment—Light	45	1,170	1,157	32	24	9	23	9	25	58	46	170	8,675
Artillery regiment—Horse	45	1,173	1,571	4	24	10	24	10	25	78	47	194	9,830
Artillery regiment—Mountain	45	1,150	1,229	..	24	7	23	7	30	61	..	124	6,405
Engineers—Pioneer battalion	16	502	165	12	..	2	12	2	10	8	4	38	2,110
Signal corps—Field battalion	9	171	206	15	..	2	4	2	5	10	5	28	1,460
Infantry division, comprising: 3 brig. inf., 1 regt. cav., 1 brig. light arty., 1 pioneer engr., 1 field battalion signal corps and necessary wagon trains	736	22,285	7,660	775	48	46	487	45	245	383	301	1,507	82,265
Cavalry division, comprising: 3 brig. cavalry, 1 regt. horse arty., 1 pioneer engr., 1 signal corps battalion and necessary wagon trains	458	10,259	12,231	414	24	63	218	63	210	611	137	1,302	77,190

To move a field army would require: 2,115 passenger cars; 385 baggage cars; 1,055 box cars; 1,899 stock cars; 775 flat cars; total, 6,229 cars, which make about 366 trains, and require this number of locomotives.

Track and Terminal Facilities

Of fully as great importance as an adequate supply of equipment is the requirement that all roadway and track facilities be put in proper condition. This point may be specially emphasized in view of a too-well-founded impression that on many lines during the last two or three years of business depression maintenance of way has been somewhat neglected. Inadequacy of facilities all along the line comes to a head at terminals. Within the last few months we have seen the far-reaching effects of a condition calling for a bunching of equipment at a few points. Such a condition is liable to arise at any one of a large number of points where it might be necessary to undertake measures of defense. It cannot be mitigated by any of the measures which may be partially effective when only commercial considerations are involved. Embargoes, or the condition that necessitates their declaration, would mean starvation to the defensive forces; demurrage would be payable in the lives and property of non-combatant citizens.

An examination of track as well as of all other facilities could best be made by a board composed of railway and

army experts. A board of army experts and practical railway men, working in co-operation with the general staff of the army, should be able to accomplish much in determining what would be necessary to fit our railway system as a whole to be operated as a unit and to the greatest efficiency for defensive purposes.

Preliminary Study of Present Conditions

If not already accomplished, the work of the general staff would probably consist largely in working out, so far as transportation lines are concerned, what would be the demands upon them at any point of the United States boundary in meeting attacks that might be made at such points. These plans would not be theoretical, but based upon what could actually be carried out with existing forces and supplies. This class of work has been an important feature of what Germany has been doing for many years. The exact knowledge of conditions has been as important as the provision made in adapting its railway systems to meet them. In the case of an offensive movement toward the border, this preliminary knowledge on the part of its military establishment was available so thoroughly in detail, even to the orders to be issued, that Germany could have started a defensive movement at any moment without bungling or hesitancy as to any of the steps to be taken. The results of similar knowledge on the part of other nations were illustrated in the mobilization of most of the troops engaged in the present European war, but particularly is this true with respect to Germany. The absence of such preliminary knowledge in the United States was painfully illustrated in the Spanish war, particularly at Tampa and at points on the Pacific Coast in connection with the campaign in the Philippines.

Through the proposed board the general staff should be informed of the facilities that are now available and of what would be necessary in order successfully to carry out its plans. An expert examination should be made of all roadways and structures over which movements would be likely to take place, to ascertain their condition as to strength and capacity. If too weak or of insufficient capacity, steps for remedying the deficiency should be recommended. The whole outcome of a defensive movement might be reversed by inability to transport some heavy guns across a bridge too weak to permit their passage; or the absence of special cars for carrying heavy guns; or lack of sufficient track and equipment facilities to transport the required number of troops or quantity of supplies within a limited time.

Such a board would keep a live list of all motive power and cars, classified by roads, number and capacity. It should know the location and capacity of all loading and unloading platforms and the steps to be taken to construct them in time of necessity. Lack of these facilities entails delay and congestion. This was noticeable at Tampa in the Spanish war. In some measure difficulties under this head arise in movements to encampments in time of peace. The board should recommend not only what improvements should be made but by whom their expense should be borne. In any preliminary preparations it obviously would be unjust to compel the railways to stand the expense of providing purely military facilities which could be of no value in their ordinary commercial business.

Employees Must Be Under Control

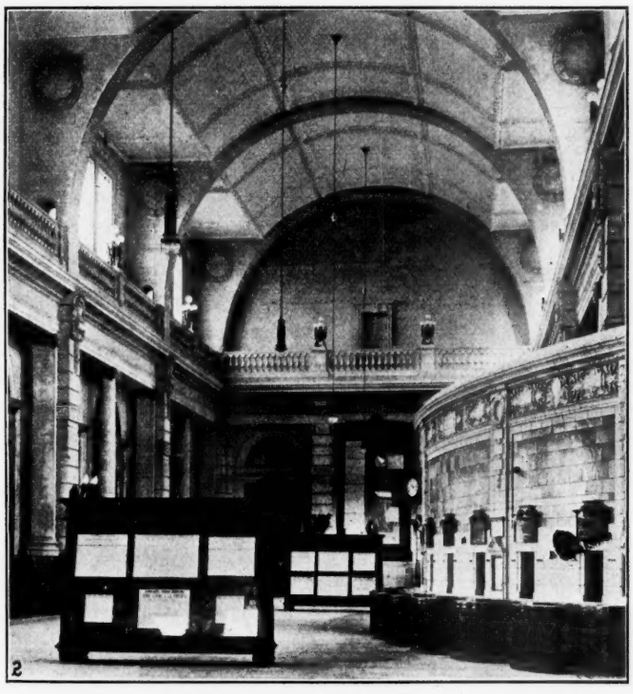
But the railways cannot be depended upon even to the limit of their present efficiency unless means can be provided for their protection against defection within their own organization. At the present moment, when trouble from any one of three or more foreign sources is threatening, four of the most powerful organizations of labor concerned in railway operation are threatening to tie up every mile of railway in the United States unless certain extreme demands for increased wages are granted. These employees know, because they are part of it, the vital function the railways perform in the commercial prosperity of the country. They know the difficulties through which the railway industry has been passing in the last few years and they know that it is impossible for the railways to meet their demands except there shall be granted measures of relief which must come, if at all, from sources entirely beyond the control of the railways themselves. They know, also, these same organizations that are now threatening to strike, that at a crisis in national affairs such as may materialize at any moment, a strike by operating railway employees would be an act of treachery to the nation to which they belong of which there is no parallel in the civil or military history of any country.

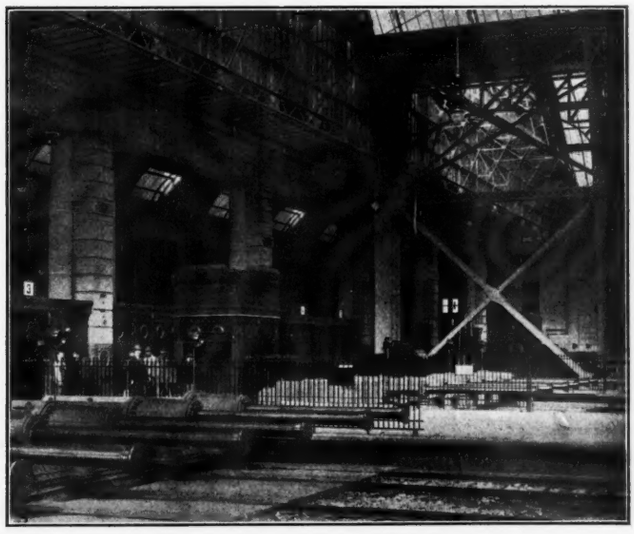
Whatever measure of control the government may be forced to assume over the railways as a part of a system of national defense will be wanting in effectiveness unless it includes absolute control over the personnel of the operating organization. No amount of study or fulfillment of requirements of plant and plans of operation will avail if there is chance of failure on the part of the employees engaged in operation. Employees who have to do with the operation of trains should be held strictly accountable for their acts. Considering the important part that the transportation system must play as an instrumentality in national defense and the fact that no human foresight can anticipate the exact time when our country may become involved in war, it would not be too much to provide that under no circumstances should a strike that would interfere with transportation be permitted to be called until after all the points in controversy had been submitted to arbitration. In case of actual hostilities all employees should be placed under military control, and any failure to stay at work and perform their duties should be made punishable just as the failure of a soldier to perform his duties is punishable. The safety and welfare of the nation must be given precedence over all other considerations.

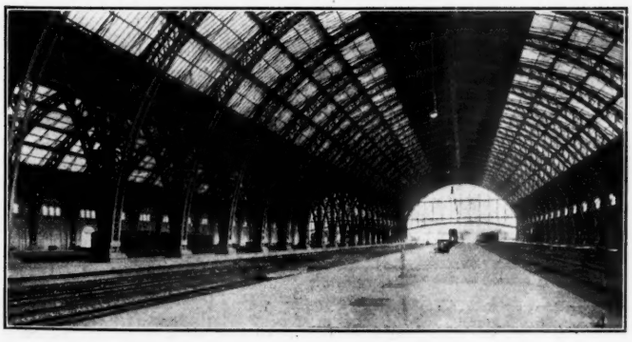
A NEW PASSENGER STATION AT BUENOS AIRES

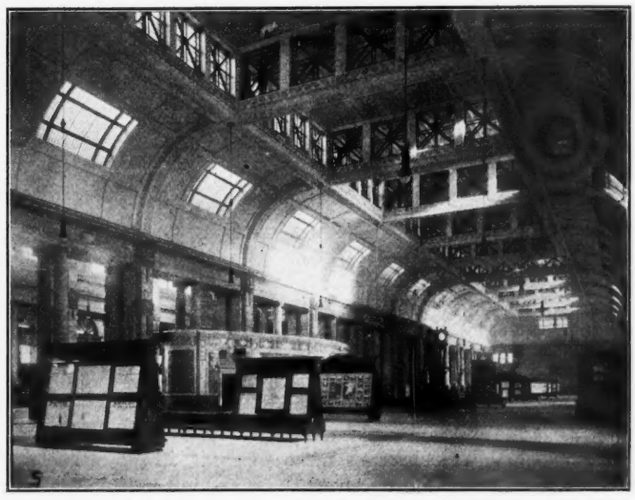
South America has the newest of large passenger terminals in the Retiro station in Buenos Aires, which was recently opened with appropriate ceremonies in which leading government and railroad officers took part. The station building, an example of the Renaissance style, is regarded as the finest in South America. As now completed, it has a length of 525 ft. on Maipu avenue, but when the ultimate plan is carried out, it will have a frontage of 760 ft. on this street and a frontage of 604 ft. on the Paseo de Julio. It is situated on ground recovered from the Plate river, and takes the place of the inadequate collection of buildings with which both the company and the municipal authorities had long been dissatisfied.

The station building has a beautiful and spacious interior. At the head of the train shed is a concourse 480 ft. long, 82 ft. wide and 63 ft. high. On the side opposite to the train shed this communicates with the ticket lobby, which is 276 ft. long, 39 ft. wide and has a barrel-vault ceiling 60 ft. high with a dome in the center, the top of which is 108 ft. above the floor. On either side of this lobby are provided the first and second class waiting rooms, dining rooms, restaurants, etc., while communication with the street is had through a covered cab drive parallel to it and 276 ft. long by 39 ft. wide. A separate entrance is provided for passengers on foot which is 33½ ft. wide and is divided in the center to separate the incoming and outgoing passengers. There is a dining room, a restaurant and a number of small private dining rooms conveniently located adjacent to the main waiting room. The large dining room also has direct









1—Street Elevation. 2—The Ticket Lobby. 3—Head of the Train Shed Showing Pneumatic Bumpers. 4—The Train Shed. 5—The Concourse

access to the street. The restaurant is a room 91 ft. by 55 ft., capable of holding 500 people.

A portion of the wall space between the ticket lobby and the concourse is partitioned off for station offices. On the lobby side of this are ticket offices with 13 windows, while on the concourse side are telephone and telegraph booths. The ticket windows are divided between first and second class passengers and carry signs indicating the names of the principal stations for which tickets are sold. For some points on the road tickets are sold which are printed by a special machine at the moment they are handed to the passenger. Baggage is handled to the platforms by means of tunnels below the track level and baggage elevators at the outer ends of the platform. Baggage is taken over the counter at the entrance into the upper baggage room, and thence by means of electric lifts into the sorting rooms in the basement under the station and through the subways. The baggage of arriving passengers is taken through a branch subway to another part of the basement and then raised to the delivery room at the street level.

The station is a stub-end terminal with a high steel arch train shed consisting of two duplicate barrels 160 ft. wide and 84 ft. high and having a total length of 787 ft. The ultimate plan contemplates an additional barrel on the side nearest the Paseo de Julio in the future. The roofs are supported by three-hinged steel latticed arches, at least one-third of the roof area being glass. The train sheds cover twelve tracks. A peculiar feature of the arrangement is that the tracks are in groups of three between the platforms. Crossovers from the two outside tracks to the inside track of each group permit the immediate release of engines bringing trains in on the tracks adjacent to the platforms. Another unusual feature is the installation of hydraulic bumpers provided in duplicate for each track.

All the upper floors of the station are being used for administration offices, and the company has introduced in the offices every modern improvement of recognized utility.

Outside of the station comprehensive plans have been made for auxiliary developments in the way of freight houses, team tracks, coach yards and engine terminals, a portion of which has been carried out in the present construction. The train shed is served by a six-track approach converging to a four-track main line. Train movements are controlled by low-pressure pneumatic interlocking controlled from two signal towers, the larger one containing a 258-lever machine. In the reorganization of these yards the plans provide for the construction of modern fireproof warehouses to have total ground area of 15,000 sq. yd. The sheds will be provided with electric cranes, and electric capstans will be installed at convenient points.

RAILWAY STOREKEEPERS' CONVENTION

The following papers were omitted from the report of the proceedings of the Railway Storekeepers' Association, published in last week's issue:

Car Record

By J. H. Waterman

No storekeeper or superintendent of a material yard has his business well in hand unless he knows by nine o'clock in the morning or sooner, the conditions of his yard. By that I mean, unless he knows just the number of cars of each class of material he has on hand and whether they are foreign, box, stock, flat or coal; or system, box, stock, flat or coal.

The management of the Burlington has ruled that if the tracks to the storehouse proper, the tracks in the material yard proper, or tracks in the tie plant yard proper will hold all the cars consigned to the storehouse, material yard or tie plant, the store department is not responsible for the cars, unless they are set on those tracks. If they are in the main yard they are in transit until set on the tracks indicated above as assigned for that purpose.

For several years I have followed the following plan and have never found anything better:

Between seven and nine o'clock, every morning, we take a check of the material yard, and, in addition any track in the yard which may be assigned for company material. Every road has a blank for this purpose and most roads take a simultaneous check of the cars on their entire road between seven and nine o'clock every morning in order that they may know the conditions of their yards and where their cars are. This report is taken primarily for the superintendent of transportation and every division superintendent has a copy of the report originated on his division that they may control the movement of the equipment.

After the yard has been checked we summarize it under the heads of cross ties, switch ties, piling and miscellaneous. We give the total number of cars on hand. If there are cars in the yard billed out, we show the number; then we note the kind of cars; the next line is total cars to be unloaded. The next division is switch ties, the next piling and then we have what we term "miscellaneous." These are cars which cannot be classified under the headings referred to above. Then at the bottom we have a summary of cars to be unloaded.

Any time after 9 a. m., the management can call up and say, "We want all the box cars on hand released today." The general storekeeper, or the man he may assign to look after this work, with the summary before him, immediately knows just how many box cars are on hand, whether foreign or system and what they are loaded with and he can get quick action. The same is true with any other class of equipment which is needed.

For the records of cars received we use a form showing one car on the tally sheet only. This form is the basis for all material received. It gives the date, the department, the initial, car number and any other data wanted. It can be used for a piece work card in unloading carload lots like cement, lumber, piling, ties, etc. It is to be assigned by the foreman. It is printed in red; wherever a red card is found we know it is material received. After proper entries have been made in any record which a store may keep, this card is filed away in a case according to the last two figures. The last figure of each car number is the corresponding figure appearing at the top of the case. The next to the last figure of each car number is the corresponding figure appearing at the left side of the case. To illustrate:

If it is car 62739, it is in the ninth hole from the left side and third from the top.

This case makes a complete car record of every car received at the storehouse or under the jurisdiction of the store department. Of course, the pigeon holes are made to conform to the size of the tally sheet or "material received" card used.

Under a test the auditor picked five car numbers received in five different months and my chief clerk located them all in 38 sec. Each card was a complete tally sheet of that car, showing all the data that can possibly be on it, including the men unloading the car and the rate for unloading it.

We use a similar form for material shipped.

It is necessary to have two filing cases, one for cars received and the other for cars shipped, and we have found that no one questions any statement we make on cars. We answer their questions while they wait.

Stationery

Previous papers and reports have fully outlined the advantages to be derived by having the stationery department consolidated with the store department and, as this report is strictly a stationery proposition, we will treat it as such.

The committee recommends what is known as standardization and uniformity of all blanks, books, car cards, carbon papers and typewriter ribbons. In explaining the benefits to be derived by the adoption of the system we advocate, we do not intend to go deeply into a comparison or, for that matter, draw very many conclusions; on the contrary, in order to show the superiority of the standardization system, we know of no better demonstration than a clear recital of our plan of standardization, portraying its cardinal virtue, simplicity. When this has been accomplished, we firmly believe one can clearly and easily draw his own conclusions, coincident with our own, from the simple facts presented.

The stationer should make a careful selection of his standard forms; i. e., those that are settled upon and least liable to change (which form should comprise 95 per cent of his stock); after this has been settled, the next step is that of standardization of the weight, quality and color of paper, color of ink, and style of ruling.

The primary essentials in working out such a plan are:

First—To confine the number of different grades and weights of stock used on the various forms to as few as the requisite service will permit; in fact to adopt as nearly a single standard of stock uniformity as possible.

Second—To change all machine ruled blanks to print rule, except in those few instances in which the machine ruling only will fulfill the purpose of the form.

Third—To regulate the size of all blanks, reducing all sizes (those which cut to a waste from the standard mill stock sizes) when possible to an exact multiple of stock sheet.

Fourth—To standardize the ink used, adopting as the standard as nearly as may be a uniform class (either copyable or non-copyable, non-copyable preferred) and color, for all purposes.

By thus standardizing the forms to whatever extent may be found practicable, the buyer creates a desirable purchase base, as it places him in a position to secure the advantages to be derived from the combination plan of printing.

There should be an efficiency or stationery committee on every railroad. In the first place, the appointment of such a committee is an excellent way of getting various departments interested in economy of stationery and supplies. Their duties should be to investigate before a new form is issued or a revision made of forms in use. Before a new form is issued some good reason should be given why it should be issued and the originator should be made to show what benefit is to be derived from its use. If this committee is empowered to exercise final authority on such matters, a resultant saving and minimizing of special items will be obtained.

A stock book record should be kept on stationery, just as much as on other items or classes of material that a railroad purchases or handles.

Agents' requisitions should be approved by superintendents, others by the heads of the various departments, not as final, but for a moral reason. Requisitions are then sent to the stationer and amounts reduced according to his judgment and information he has on file in his office.

One man in each office should be held responsible for the stationery used in that office; he only to have the right to order and distribute supplies, and as a reminder to all who have charge of making up stationery orders we would impress upon their minds the importance of first taking an inventory of all supplies on hand, before making up their orders.

The necessity for inspection of offices using stationery rests with the stationery department. The stationer or his assistant should make periodical trips over the line, visiting as many offices as practicable to find in what condition the stationery is kept and arrange for the return to the storehouse of surplus stock and obsolete forms; also, to see that no blanks or books are being used for any purpose other than originally intended, at the same time encouraging agents and others to give this feature more attention.

The committee recommends that the use of printed letter heads for inter-company correspondence be discontinued, as plain paper of a fair quality is good enough for this purpose, thereby restricting the use of printed letter heads to outside correspondence.

It also recommends the use of self-addressed envelopes, wherever it is possible to do so. It also recommends the extensive use of repeat envelopes with eight printed squares for the 6¼ size envelope and twelve squares for the No. 10 ungummed flap envelope; also the use of a flap string envelope, size 12 in. by 15 in. wherever it is possible to do so. Envelopes are to be used for transmitting mail and reports between agents and the accounting department, car service department, freight claim department, etc. All mail going to an agent from these departments is sent in the same envelope. This style of envelope is used extensively on some railroads, effecting a very substantial saving.

The extensive use of pencil holders is recommended especially at this time on account of the acute situation on copying pencils due to the shortage of ingredients affected by the war.

It would be of interest to all railroads to consider the advisability of using automatic printing machines, especially for the handling of small forms and runs, which can be done efficiently and at an absolute saving as has been successfully demonstrated.

As the majority of our passenger trains are taxed to the limit with baggage and express, it is deemed advisable to make shipments of stationery by freight whenever possible to do so.

Some roads ship their stationery in supply cars. Shipments are loaded in station order, and shipping notices mailed to the superintendent. The car is then billed to the nearest point on the division. The superintendent turns the shipping notices over to the road-masters who accompany the car over the district and see that supplies are properly distributed, at the same time getting a receipt for such supplies. At the end of his district the roadmaster turns what receipts he has over to the roadmaster of the next district, until the car has covered the entire division. This plan is working out very successfully and the loss, damage and pilfering has been reduced to a minimum.

The report is signed by F. E. Nobes, chairman; W. W. Griswold, L. P. Landon, D. B. Carroll and O. T. Burleigh.

Discussion.—Several members urged the use of cheap paper without printing for inter-department correspondence. Large savings result.

New York City Bridge Traffic.—The New York State Public Service Commission, First district, reports that on a typical day, October 28 last, the number of persons passing over the four bridges across the East River, between Manhattan and Brooklyn, in a period of 24 hours, was 804,146, an increase of 41,064 over the total on the day when the count was made in the preceding year. The largest traffic was that over the Williamsburg bridge, 355,561; and the first bridge built, known as the "Brooklyn Bridge," takes second place, with 243,617. The Manhattan bridge, near the Brooklyn bridge, was traversed by 111,314 persons; and over the Queensboro bridge, at Sixtieth street, 93,654 passed. On each of the bridges the eastbound and the westbound movements were approximately equal in number. The traffic over the Manhattan bridge, which is now the route of trains to and from the new Fourth avenue subway in Brooklyn, was more than twice the number recorded in the count made in 1914.

A. L. MOHLER

A. L. Mohler, president of the Union Pacific and of the Oregon Short Line, has announced that he will retire from active service on July 1, but will continue to be identified with the companies in an advisory capacity. It is understood that his retirement is due to a desire to be relieved of the responsibility of active service on account of ill-health resulting from the effects of a serious fall on the ice while skating last winter, and that he has been preparing for this step for some time.

Mr. Mohler is 66 years of age and has been engaged in active railroad work for 48 years. He has been identified with the Union Pacific during the period of its most rapid development and its greatest prosperity since 1904, successively as general manager, vice-president and president, and he is responsible to a large extent for the efficiency of its management and its excellence as a physical property.

While he has been especially successful as an operating executive, his experience has not been confined to this department and he had served in various positions in the traffic departments of several roads when he was transferred in 1888 from general freight agent to general superintendent of the St. Paul, Minneapolis & Manitoba, now a part of the Great Northern. He has thus had a well-rounded training which was especially valuable in fitting him for the presidency of the Oregon Railroad & Navigation Company and later of the Union Pacific.

A. L. Mohler

Among his most prominent personal characteristics are his absolute fairness and the spirit of helpfulness he has displayed toward his subordinates, coupled with a diplomacy which has greatly assisted in promoting team work on the part of the organization and popularity with the patrons of the road.

It is said of him that he has been naturally inclined to give men working under him more rather than less credit than they were entitled to and that the secret of his success has been his willingness to encourage initiative by supporting his subordinates. His men have had implicit confidence in his word and have felt free to act upon verbal orders without written instructions.

A characteristic illustration of his attitude toward his subordinates is the fact that when he went to the Union Pacific he did not even take his secretary with him. One of the principal objects with which he was concerned in connection with the establishment of the educational bureau was to train Union Pacific men for promotion when vacancies occurred. He has been unusually ready to give advice and help to his subordinates and since becoming president his ambition has been mainly directed toward promoting the development of the men under him.

Mr. Mohler was born in 1850 at Ephrata, Pa. He entered railway service in 1868 as warehouse and office clerk of the Chicago & North Western at Galt, Ill. In 1870 he became a station agent of the Rockford, Rock Island & St. Louis at Erie, Ill.; in 1871, clerk of operating accounts in the auditor's office of the same road. From 1871 to October, 1882, he was on the Burlington, Cedar Rapids & Minnesota, for two years as traveling auditor and pioneer agent; two years as chief clerk in the freight department; one year as assistant general freight agent, and six years as general freight agent. On October 9, 1882, he was appointed general freight agent of the St. Paul, Minneapolis & Manitoba (now the Great Northern) and retained that position until March 1, 1886. He was then until January 15, 1887, land commissioner of the same road; until April, 1888, general freight agent; from April to October 10, 1888, general superintendent; from October 15, 1888, to September 1, 1889, assistant general manager of the same road, and from September 1, 1889, to December 1, 1893, general manager of the same road and the Montana Central. From July 21, 1894, to July 1, 1897, Mr. Mohler was general manager of the Minneapolis & St. Louis. On the latter date he became president and general manager of the Oregon Railroad & Navigation Company. On April 1, 1904, he was appointed general manager of the Union Pacific, which position he held to October 1, 1911. From April, 1905, to October 1, 1911, he was also vice-president of the same road, and since the latter date he has been president of the Union Pacific and the Oregon Short Line.

THE PEOPLE'S INTEREST IN WATER-POWER RESOURCES. — Cheap power promises to be in some future century this country's largest asset in the industrial rivalry among nations. Our unsurpassed coal reserves, reinforced by these water-power resources, constitute a strong line of national defense in that they form the real basis for an industrial organization of the nation's workers. It is only through abundant and well-distributed power that the other material resources of the country can be put to their highest use and made to count most in the nation's development. The people's interest in water power is greatest in its promise of future social progress, and such an interest is well worth protecting.—*George Otis Smith in a recent geological survey paper.*

PANAMA CANAL A PERMANENT FACTOR.—President William Sproule of the Southern Pacific, commenting on the resumption of traffic through the Panama canal says that the setback caused by the slide is only temporary, and that the temporary setback will not prevent the return of shipments to the waterway. "The closing of the canal was a mere incident. The railroads have never believed, and certainly the Southern Pacific does not now believe that the Panama canal is or will be put out of business by the railways. This temporary setback is of the kind which may be expected for a long time to come, just as a railroad through mountain canyons is subject to landslides for a considerable period after construction. Looking into the future broadly, the various kinds of traffic will take the routes of carriage that suit the commodity best, every condition considered."

Association of Railway Claim Agents' Convention

Abstracts of Papers Presented and Discussions at Twenty-Seventh Annual Meeting at Atlantic City

THE 27th annual convention of the Association of Railway Claim Agents was held at the Hotel Traymore, Atlantic City, N. J., May 17, 18 and 19. President H. B. Hull, general claim agent of the Illinois Central, presided. There were over 200 men in attendance, representing 103 railway systems.

PRESIDENT'S ADDRESS

Mr Hull in his address emphasized the importance of the association. He touched upon the difficulties attending the question: "When is a railway employee engaged in interstate commerce?" and said that the papers on this subject which were presented each year were of great benefit in explaining what course should be followed. He said further that the most comprehensive and valuable statistics ever prepared on the important subject of injuries to trespassers on American railways were compiled and published by the association.

Through the association the claim departments of the railroads which are members are cemented together in such a manner as to result in a very great saving to the railroads in advantageous interchange of work. Thus an accident occurs in Florida. The injured and the witnesses reside in New York and California. If the Florida railroad had to send its claim agents to those states to interrogate the witnesses or make adjustments, as was formerly the case, the traveling expenses and loss of time would be considerable and the claim agents would be in strange surroundings and unable to get the best results. Under the system worked out by the association, the claim department of the Florida road simply writes the claim departments of the railroads in New York and California and the matter is much better taken care of.

The association at its conventions considers the important question of fraudulent claims. The organization with its systematic method of having the members keep in touch with each other concerning the great numbers of professional crooks who prey upon the railroads in fraudulent personal injury claims, has saved the railroads many thousands of dollars. Fraudulent claims are on the decline. The association claims the credit for the birth of the campaign for accident prevention, one of its members having originated the idea which has since been discussed fully in the association meetings. Mr. Hull also spoke of the advantages which were being derived from fair dealing in keeping down litigation and took an opportunity to condemn the ambulance chasing lawyers and their contingent fees.

THE ARDMORE EXPLOSION

By Jno. S. Douglass
General Claim Agent, Gulf, Colorado & Santa Fe

Mr. Douglass gave the details of the disaster at Ardmore which took place at 2:15 p. m., September 25, 1915. The accident was caused by the explosion of a tank car containing liquefied petroleum gas or casing head gas, and resulted in the death of 48 persons, injury to over 500 and an enormous property damage. On October 4 while investigations were still going on, President Ripley announced that the Santa Fe would assume responsibility and proposed that all disputed claims be referred to a committee of six Ardmore citizens which had been chosen to look into the matter. In the agreement executed by the Santa Fe and the claimants, the railway and the citizens' committee were given the right to investigate the claims; to have in personal injury cases the injured party examined by physicians; in property damage cases, the property inspected and estimates made by men of their selection, which expense was to be borne by the railway. The claimant, of course, had a right to select his own experts or physicians, and to submit their report to the railway or to the committee, if such became necessary. Because of the varied character of claims, it was necessary for the railway and also the committee to select experts in practically every line of trade.

On November 18, the committee heard its first case, and up to that time the Santa Fe had settled 1,474 claims. On April 8, 1916, the committee heard its last case. The committee heard and awarded judgments in 35 cases. The Santa Fe has settled up to date 1,967 cases, including among this number 48 fatal accidents, 504 personal injuries, and 1,415 property damage claims. There are now pending against the company 49 claims—the majority of which are fraudulent and will never be settled. The company has expended up to date, in the handling of this situation, $938,546, which amount does not include the company's own property loss or the salaries of the claim adjusters while engaged in this work.

CLAIMS OF RAILWAY POSTAL CLERKS

Frank Wenter, Jr., general claim agent of the Chicago, St. Paul, Minneapolis & Omaha, read a paper on this subject in which he took up the following points: To what extent would it be advisable for railways to bring to the notice of the government cases of malingering; and how can we induce the government to take action. He referred to the fact that the railways were not properly paid for carrying the mails and made the point that under such conditions they should take every care to keep down unreasonable claims of mail clerks. Railway postal clerks as a rule are men of high character, but cases do exist of fraudulent claims, and railways should not hesitate to bring them to the attention of the government. They will usually secure satisfaction if they will take up the matter with the proper authorities.

PREVENTION OF ACCIDENTS

By R. C. Richards
General Claim Agent, Chicago & North Western

Mr. Richards in his paper paid particular attention to accidents to employees. He showed the advantages of the safety committees and explained how they could be used most effectively to cut down the various kinds of accidents, the several classes of which he enumerated in detail. According to statistics of the North Western 83 per cent of the employees killed and 82 per cent of the employees injured, are killed and injured in accidents which are brought about by dangerous, careless or thoughtless practices, while only about 7 per cent of the employees killed and six per cent of the employees injured, are killed and injured by reason of defective cars, tracks, engines, tools, machinery and other defective things.

Mr. Richards also spoke of the prevention of accidents at highway crossings, among his suggestions concerning their prevention being one that at especially dangerous and busy crossings, the flagman should be sworn in as a police officer and given a star or other badge.

The average cost of railroad accidents, counting the death cases, serious and permanent injuries, as well as slight injuries, and including the cost of caring for the injured is about $115 a case. In the five years and nine months the

safety organization has been in existence on the Chicago & North Western up to May 1, 1916, with increased earnings and 450 additional miles of railroad, there have been 17,052 fewer accidents. One can easily figure the saving in dollars and cents.

Mr. Richards also suggested that fewer accidents would result if more care were taken to guard against the employment of unfit men. He proposed the adoption of some plan of selecting, employing and training men for safe and efficient performance of duty.

Discussion. This paper was read by F. B. Piesrol, assistant general claim agent of the North Western, Mr. Richards having been unable to be present. C. W. Lacy, district claim agent on the Rock Island, emphasized the importance of securing the coöperation of the men. Twenty per cent of all accidents on his district of 2,000 miles in a given period were eye accidents, 95 per cent of which could have been prevented if the men had worn the goggles provided for them. Charles T. Banks, commissioner of safety of the Erie, declared that in his opinion bulletins alone were of little value. Motion pictures are highly effective. The Erie is enlarging many of its safety committees with good results. The Erie also issues safety rules once a month but instead of being in bulletin form they are part of a book in which the man keeps a record of his time. Similar books will be provided for shop employees. Mr. Banks found very little of value in bulletins printed in several languages. Marcus A. Dow, general safety agent of the New York Central, said that it was more necessary to reach the man in charge than the man under him, for his frame of mind is reflected in his subordinates. The foreman must be made to realize that it is up to him to know if his men are careless and that if there is an injury to one of them it is a reflection upon his efficiency as a foreman.

COOPERATION OF CLAIM AND OPERATING DEPARTMENTS

By E. W. Sprague

Assistant General Claim Agent, Yazoo & Mississippi Valley

Because the claim and the operating departments get along without friction does not necessarily imply that there is efficient coöperation between the two. The management of the Illinois Central some three years ago began an effort to impress upon operating officers that their duties with reference to accidents and claims did not terminate with the filing of a report, but that it was also their duty to assist the claim department in procuring all the facts and rendering any possible assistance in the investigation. A circular embracing the idea was issued to division superintendents. The general manager later made a trip over the entire system with the general claim agent, and on each division the officers and foremen were assembled and the manner of coöperation with the claim department in the handling of claims was fully outlined. The division officers were quizzed as to pending and recently settled claims and their interest aroused. Another trip was made within a few weeks and like trips have been made from time to time since.

In addition to this, trips have been made over each division on a motor car by the claim agent, accompanied by the superintendent, trainmaster and roadmaster, the claim agent carrying with him all pending claims on that division, and taking them up with the section gang, or station employees who are primarily interested in them. It was observed that a trip of this character gained much importance by the presence of the superintendent, in that it impressed the men that claim work was deemed important. The claim agent thereafter enjoyed more ready and hearty coöperation.

The superintendents all meet with the general manager once a month to discuss operating matters and in each of these meetings the general claim agent presents a list of claims needing attention, and an estimate of the probable cost of each case. The cases are then carefully gone over and the superintendents are required to state what they know about them and what steps have been taken to avoid other cases of like nature. Monthly statements of damage expense disbursements on each division are prepared and mailed to each superintendent. One statement shows the number of casualties, fatal and non-fatal, the total number of employees on the division and the percentage of employees injured to the total, and divisions are entered in the order of their rank, based on their percentage showing. A separate ranking is given shops. Another statement shows the disbursements on each division on account of personal injury, and another the expenditure on account of stock killed on the right of way. These disbursements are distributed on the basis of 100 engine miles, the divisions being ranked according to the showing. Comparisons are made with preceding months and years. In serious accidents the trainmaster, master mechanic or other officer holds an investigation and has the claim agent attend.

In settling with an injured employee, his superior officer is first consulted by the claim agent and his ideas obtained as to what consideration should be given to the employee because of his period of service, his record, and the facts and circumstances connected with the accident tending to excuse him. The officer does not in any way dictate to the claim department the amount to be paid, but simply recommends. If desired by the claim agent he uses his influence with the claimant in endeavoring to bring about a satisfactory adjustment. The claim agents are in almost daily consultation with the division officers regarding claim matters.

This close coöperation has given great impetus to the safety first movement, and it has helped greatly the success of the movement.

Discussion. Mr. Hull noted that as a result of steps taken on the Illinois Central the amounts paid out in claims had been reduced 30 per cent from the figures of 10 years ago. The paper was also discussed by others, who told what was being done on their roads. Among them were S. J. Peterson, general claim agent, Union Pacific; W. C. Cartledge, claim agent, Rock Island; B. F. La Rue, assistant general solicitor, Lehigh Valley; A. R. Thickitt, general claim agent, Missouri, Kansas & Texas; and Charles A. Theis, chief claim agent, New York Central.

THE FEDERAL EMPLOYERS' LIABILITY ACT

By Theodore W. Reath

General Solicitor, Norfolk & Western

Owing to difficulties of classification in or out of interstate commerce; owing to ambiguities in the act of congress itself; and owing to the consequent confusion of judicial thought, no principle can be found by which a personal injury can be classified. The difficulty is inherent and attributable to the original ruling that a regulation of the master's liability to his servant for an injury is a regulation of commerce. The feature of commerce seems irrelevant to the consideration of the faults of a master to his servant. But the decisions have held that the power of congress to regulate commerce includes the power to enact an employers' liability law.

The descriptive phrase of the act is "any person suffering injury while he is employed by such carrier in" commerce between the states, etc. The supreme court has stated the test in Shanks' case[1] to be "the true test of employment in such commerce in the sense intended is, was the employee at the time of the injury engaged in interstate transportation or in work so closely related to it as to be practically a part of it?" In a notable case decided on the first of the present month (C. B. & Q. vs. Harrington, No. 853 of October Term, 1915, Supreme Court of the United States), Justice Hughes, writing the opinion of the court, and excluding from the act a switchman injured in switching coal cars for fuel coal supply into the coal chutes from which the carrier's engines were supplied, said: "The Federal Act speaks of

[1] Shanks v. Lackawanna, 239 U. S., 556.

interstate commerce in a practical sense suited to the occasion," intimating that no exact statement of a principle to delimit interstate from state commerce can be made.

The difficulty—indeed the impossibility—of stating any test which will express an accurate principle to delimit interstate injuries from those which are not interstate may be illustrated by the variety of decision in matters of classification. The familiar Pedersen case[2] was a case where the injured employee was an iron worker at the time employed in carrying from a tool car to a bridge some bolts or rivets which were to be used by men at the bridge that night or early next morning in repairing the bridge by taking out an existing girder and inserting a new one, and his injury was incurred in crossing the track carrying the bolts or rivets. He was struck by a train, and the court held that he was employed in interstate commerce. This classification was accomplished in part—perhaps entirely—by asking and answering in the affirmative these questions from the opinion:

> Was the work being done independently of interstate commerce in which the defendant was engaged, or was it so closely connected therewith as to be a part of it? Was its performance a matter of indifference so far as that commerce was concerned, or was it in the nature of a duty resting upon the carrier?

And the court answering these questions observed that bridges are indispensable to interstate commerce and that they must be kept in repair. The court proceeded to reason the matter that carrying bolts for the repair of the bridge was "a minor task which was essentially a part of the larger one."

But the court's queries, the answers to which were found so persuasive, queries looking to whether the work was "being done independently of interstate commerce" or was "a matter of indifference so far as that commerce was concerned," are not decisive of the classification.

But the characterization of Pedersen's work of carrying bolts as "a minor task which was essentially part of the larger one" seems to suggest a direction in which to look for the distinction between state and interstate commerce; but here again one experiences difficulty in stating a principle decisive between the "minor task" and "the larger one." The unit of work which gave federal color to Pedersen's occupation was the building of the bridge; and the unit which gave state color to Harrington's work was "the removal of the coal from the storage tracks to the coal pocket, or chutes." How the coal would be disposed of from the latter position seems to have been regarded as outside of Harrington's task. Somewhere there is a mean; too much regard must not be paid, as the court warned us in Carr's case[3] to "the physical position of the employee at the moment of the injury" to the "minor task" in which he was engaged, and, on the other hand, the scope of the "larger" task must not be exaggerated. So in setting out cars from a train the task which colors the employee's work appears to be the train unit, not the car unit, and in the Carr case, therefore, the fact that there were interstate cars in the train from which Carr was setting out intrastate cars gave federal color to his occupation even at the moment of his injury. The work of cutting out the intrastate cars was held incidental to the operation of the interstate train.

As classification is vital to a successful practical administration of the claim departments we must try to do something constructive.

Can the lawyer suggest the considerations which are likely to be deemed controlling? A consideration of the distinction between Pedersen's case and Harrington's case and of some other decisions seems to suggest the following:

1. Work in repairing a facility which of necessity is and must be used in interstate commerce, such as the bridge for which Pedersen's bolts were to be used in partial reconstruction or the car in Maerkl's case, will be classified as interstate.

2. Injuries to trainmen and others in the operation of trains (a) actually running interstate without regard to the lading; (b) hauling in part or wholly interstate commerce; and in the operation of (c) work, ballast, gravel, and similar trains moving for repair and maintenance of the interstate railway, will be classified as interstate.

3. Work which has no direct connection with interstate transportation itself or with a facility necessarily used for that transportation is outside the federal act, though by links of a circumstantial chain the work may be connected with interstate commerce. An injury, to be classified under the federal act must be incurred in work done actually in interstate transportation or so closely related to that activity "as to be practically a part of" interstate transportation. The purpose of the employee's work is probably the decisive inquiry; a purpose which must be so closely related to interstate commerce "as to be practically a part of it." The existence of a single intervening step between the work and interstate transportation would, under the Harrington case, seem to divorce the work from interstate commerce. Apparently we are safe in asserting that all work in interstate transportation service itself and all work actually being done upon a facility (such as a track or bridge, a locomotive or car necessarily used in interstate commerce) would be within the federal act, but, as at present advised, all else would seem to be excluded.

[2] Pedersen v. D. L. & W., 229 U. S., 146.
[3] New York Central v. Carr, 238 U. S., 260.

CLAIM ECONOMICS

By Frank V. Whiting
General Claims Attorney, New York Central

It seems almost unnecessary to suggest that the bed rock foundation of a claim organization must be *honesty*. This brings the greatest asset we can possibly desire to insure success, that is the confidence of those with whom we deal.

Should claims be handled under the jurisdiction of the operating or the law department? The answer is that, strictly speaking, the law department is preferable, but generally speaking, it is immaterial; the two important factors being the man in charge of the claim work and the man to whom he reports.

The "man in charge" to be successful may have all the attributes of a real man, but with these alone he cannot succeed unless he be granted authority and responsibility—power to direct the men in all their endeavors; to authorize the adjustments of claims, and to fix and control the general policy. There should be no opportunity for claimants or lawyers to appeal successfully to someone in another department, and especially to say that they can get more money out of the law than the claim department. The adjustment of all claims before or after suit should be controlled by the head of the claim department, even to trial table settlements. The responsibility then rests with him for the ultimate result.

The greatest difficulty and need in our work is the selection and retention of the right men. We want men of character—honest and loyal, but with a broad view of humanity, a willingness to regard their fellowmen as human beings, and to sympathize with them. It is not enough to hire a man from another department, put him in the field, either alone or with some other man, give him a set of instructions and a bunch of blanks and allow him to work out his own salvation. Men must be constantly educated to enable them to increase their efficiency and knowledge of the things in which they deal. No better method of development for men generally can be suggested than frequent meetings, at which all details of the work as well as methods are fully discussed, and suggestions made and considered; but special emphasis should be laid on self-help, the necessity for constant study.

It is essential to have charge of the investigation as well as the adjustment of all claims. Claim agents should deal with employees in the first instance, not only as to the circumstance of injury, but as to settlement. Railroads with relief departments have yet to realize the importance of employee

accidents, and while compensation laws, if applied fairly to all employee cases, may remove to some extent the importance of such claims, yet, in a measure, in serious cases, these roads will have to meet the situation differently than in the past.

The claim department should have charge of the surgical department, for the reason that 95 per cent. of the service of the company surgeons is for the benefit of the injured, and the claim department has the greater interest in the result of the surgeon's work.

Our experience has taught us to see further the cause of accidents and the remedies to be applied, than those charged directly with responsibility for conditions. A good claim man is a born exponent of "safety first." The present breadth of the safety movement on railways owes its inception and progress to the claim men of the country. It should be and it is our duty to prevent as well as investigate and adjust accidents.

We need, as much as ever, men qualified to secure the evidence in the case, to transfer what the eye has seen and the ear heard on paper, so that others may see and hear again that which has happened. It is well to be able to know and define the proximate cause of an accident, but too much attention to this feature alone in a statement will result in omissions vital to the case. Many men of experience fail to cover the ground fully in the statements they make, not on account of their lack of ability alone, but because they have not had drilled into them the real needs and reasons why certain collateral happenings should be chronicled.

Many a claim has been satisfactorily adjusted on nerve alone. You make your offer and wait and know it will be accepted. Well and good—but you must know when the other fellow has the same disposition and not lose your opportunity by waiting. You have many times made extraordinarily good settlements, not because of your ability and tactics, but in spite of them, owing to the attitude of the claimant, who is either really honest, or in some instances, may not know the "trial value" or the "in the hands of my lawyer value" of his claim. True the world is full of frauds, but they are smothered by honest men, although sometimes it is marvelous how easy an honest man can make his conscience yield to a demand for money from a corporation in excess of that to which he may reasonably be entitled on account of his injuries. Then we are all acquainted with the interested liar in most actions. Of course, our witnesses are never interested and never lie, and we grow choleric in our "con*damn*ation" of the jury when their testimony is not believed.

Courteous treatment to all those with whom you deal, proper and satisfactory settlements or disposition of claims on their merits, will bring a reputation for fairness towards the public, as well as the employees, and will result necessarily in giving you a most important advantage in the adjustment of claims, and that is the *confidence* of the claimants. However, it is not best to rely too much on arguments to bring about a settlement, especially in death and serious injury cases. What was paid someone else under similar circumstances, the amount of money that this or that person netted at the end of a lawsuit is of extreme interest to those with whom you deal. There is perhaps more unreliable information on this subject floating around than you can ever overcome, but if you can in a measure produce evidence that cannot be denied, you will aid materially in reaching a satisfactory result. Newspaper clippings, frequently in serial form as to a given case, should be collected and photographed. Vouchers and drafts, sometimes letters of appreciation from a grateful claimant with whom a satisfactory settlement has been consummated, items in regard to the results of trials, judiciously selected and photographed, are most convincing and potent arguments in your behalf, and they cannot be gainsaid. [Mr. Whiting showed reproductions of photographs which he had used to convince claimants of the unreliability of newspaper accounts which they had read and which they had confidently believed would support their own extravagant claims.]

THE AMBULANCE-CHASING LAWYER AND DAMAGE-SUIT DOCTOR

In a paper on this subject, W. L. Alexander, general claim agent of the Missouri, Kansas & Texas, said that were it not for the ambulance-chasing lawyer we should not have the damage-suit doctor. He referred to the best methods of combating the work of the lawyers who defend fraudulent claims, and said that the remedies were fair dealing and publicity. He gave cases in which the railroads had fought fraudulent claims successfully and in which publicity had been given to the improper practices of the lawyers, with very favorable results. He also spoke against contingent fees and the lack of adequate barratry laws.

Election of Officers.

The officers elected for the ensuing year are: President, W. F. Every, general claim agent, Northern Pacific; vice-presidents, J. S. Douglass, general claim agent, Gulf, Colorado & Santa Fe; Charles A. Theis, chief claim agent, New York Central, and J. J. Donahue, chief law agent, Louisville & Nashville. Willis H. Failing, claims attorney, Central of New Jersey, Jersey City, N. J., was re-elected secretary and treasurer. Louisville, Ky., was chosen as the place for the annual meeting next year.

MASTER BOILER MAKERS' CONVENTION

The tenth annual convention of the Master Boiler Makers' Association was called to order by President Andrew Greene Tuesday morning, May 23, at the Hotel Hollenden, Cleveland, Ohio. After the invocation by John H. Smythe, a past president of the association, Mayor Harry L. Davis welcomed the association to the city, Past President P. J. Conrath responding. Mr. Greene then delivered the president's annual address.

An address by D. R. McBain, superintendent motive power, New York Central, was read by the secretary, Mr. McBain being unable to attend. He called attention to the importance of several of the subjects which are before the association for consideration this year, referring particularly to the relation of the oxy-acetylene and electric welding processes. Each has a field in which it cannot well be supplanted by the other and the application of both should therefore be carefully developed in locomotive maintenance work. In speaking of the action of long tubes and the bulging of front tube sheets, Mr. McBain referred to his own investigations, which indicate that the two subjects are closely related. When leaky tubes are caulked in the firebox while the boiler is still hot, the tubes are often found with the bead from 1/64 in. to 1/32 in. away from the sheet. Beading clinches the tubes in this position, resulting in a tendency to shorten the normal distance between tube sheets due to the tendency of the tubes to straighten out under conditions existing when the engine is in operation. Mr. McBain commended the association for its effort to obtain an extension of the time limit for the removal of flexible staybolt caps now prescribed by the Interstate Commerce Commission.

Wm. C. Connelly, president of the American Boiler Manufacturers' Association, spoke briefly of the work of the association in an effort to bring about the adoption of a standard boiler code for the construction of stationary boilers.

After the close of Tuesday's session moving pictures of an educational nature were shown in the convention hall by the National Tube Company and the Carnegie Steel Company.

A further account of the proceedings of the convention will appear in next week's issue and a complete list of the companies having exhibits at the convention will be found in the news section of this issue.

The Season's Work on the Quebec Bridge

Program for Completion of Structure During Present Year and Outline of the Erection Methods

By A. J. Meyers
Chief Draftsman, Board of Engineers, Quebec Bridge, Montreal, Que.

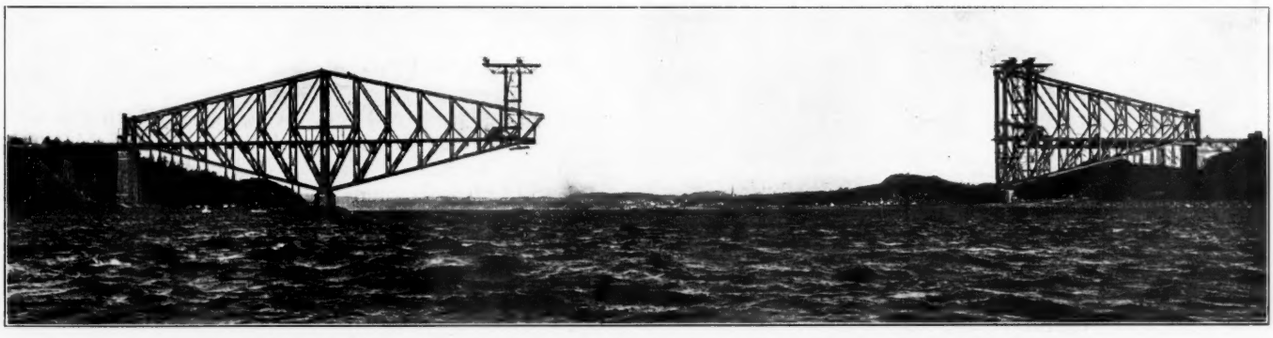
AT the close of the season of 1915, approximately 46,000 tons of steel had been erected in the north shore anchor and cantilever arms and the south shore anchor arm, including the main post, of the new Quebec Bridge. As the steel in the bridge will weigh about 65,000 tons, approximately 19,000 tons yet remains to be placed. Of this amount the south shore cantilever arm contributes 13,000 tons and the suspended span about 6,000 tons.

The erection of the south shore cantilever arm was properly started about April 1, 1916, and three weeks later the first panel adjacent to the main pier was well under way. Judging from the time consumed in placing the north shore cantilever arm, the progress of erection on the south shore should be approximately as follows:

Main panel	Days required	Date of completion	Tons of steel to be erected
16—14	40	May 10	3,100
14—12	30	June 9	2,650
12—10	22	July 1	1,960
10— 8	16	July 17	1,460
8— 6	12	July 29	1,300
6— 4	9	Aug. 7	850
4— 2	14	Aug. 21	630
2— 0	15	Sept. 5	650
Total	158		12,600

In the erection of the south shore cantilever arm, each panel is completed as the traveler advances, the final bracing for each panel being put in place by the rear booms of the traveler. On account of the large section and length, the bottom chords are fully spliced twice between the main panel points. This requires that they be supported while the different parts are being assembled and lined up on what is known as a "flying bridge." This flying bridge is attached at its shore end by a pin driven through a temporary bracket, which is bolted to the bottom flanges of the chords already placed. The front end is tied back to the compression diagonals by means of yoking girders and links. The adjusting of the chord for riveting, and the driving of pins connecting the chords to the tension verticals are done by means of jacks placed on this bridge. When a panel is completed the bridge is taken up by the cranes of the traveler and moved ahead to its new position.

The operating schedule for each panel of the cantilever arm is approximately as follows: With the traveler standing with its front legs at a main panel point F_n, the flying bridge is moved forward into position. The first panel section L_n-L_{n-1}, of the lower chord is then placed with its portion of the lateral bracing, followed by the lower section L_n-M_{n-1} of the compression diagonal with the sway bracing to the diagonal in the other truss. The sub-tension diagonal M_n-M_{n-1} is then erected and the pins connecting it to the compression diagonal and the main point M_n are driven. The sub-post M_{n-1} F_{n-1} and the floorbeam at F_{n-1} are next placed and the floor system from the main panel point F_n to the sub-panel point F_{n-1} laid. The traveler is then advanced until the front legs rest at the sub-panel point F_{n-1}. In this position the second panel section of the lower chord L_{n-1} L_{n-2} is placed on the flying bridge. The upper half, M_{n-1} M_{n-2} of the compression diagonal with the sway bracing to the other truss is next erected, followed by the portal bracing M_n-M_n plus 1 and the vertical post sway bracing M_n U_n, in the panel to the rear of the traveler. The main tension diagonal U_n-M_{n-2} with field splices completely riveted up is then hoisted into position and the pins driven. This is followed by the tension vertical L_{n-2} M_{n-2}, the vertical compression post U_{n-2} M_{n-2}, and the supporting truss U_n-U_{n-2}, carrying the top chord eyebars, in the order named. The top chord pins at the panel point U_n are then driven and the last truss pin connection is made by jacking up the bottom chord from the flying bridge and driving the pin connecting the tension vertical L_{n-2} — M_{n-2} at M_{n-2}. The erection of the sway bracing for the tension vertical, the floorbeam at F_{n-2} and the floor system from the sub-panel point F_{n-1} to the main panel point F_{n-2}, follows immediately. The traveler is then moved out into position to repeat the operation for the next panel.



The Quebec Bridge from the River Showing Progress at the Beginning of This Season

As noted above, it is expected that the south shore cantilever arm will be finished by the end of the first week in September, 1916, when the bridge will be in readiness for the floating in and hoisting of the suspended span. This span is 640 ft. long and 88 ft. wide, and weighs in the floating condition, approximately 5,000 tons. The greater part of the floor steel will be left off and placed by means of derrick cars after the span is coupled up to the ends of the cantilever arms.

The suspended span will be erected in the shallow waters of Victoria Cove, about three miles below the bridge site, on the north shore of the river, the work of erection proceeding simultaneously with that of the south shore cantilever arm. The foundations for the falsework bents supporting the trusses and the approach track were prepared during the sea-

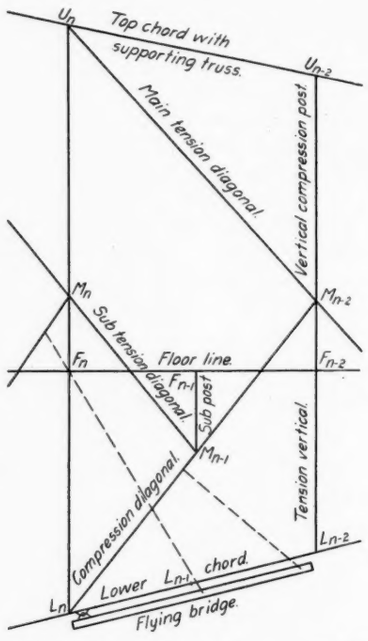
son of 1915 at the periods of low tide. This work was rather difficult, requiring considerable blasting, and could not be carried on with any great speed, as the time available was only from two to four hours each day.

North Cantilever and Anchor Arms Completed with Traveler in the Foreground

The span will be supported during erection on staging placed under each panel point. The traveler, which erected the north shore cantilever and anchor arms, will be erected on bents immediately adjacent to the staging of the span with the top trusses and traveling cranes left off. The steel will be handled by means of the four 70-ft. 30-ton booms placed one at each of the four corners.

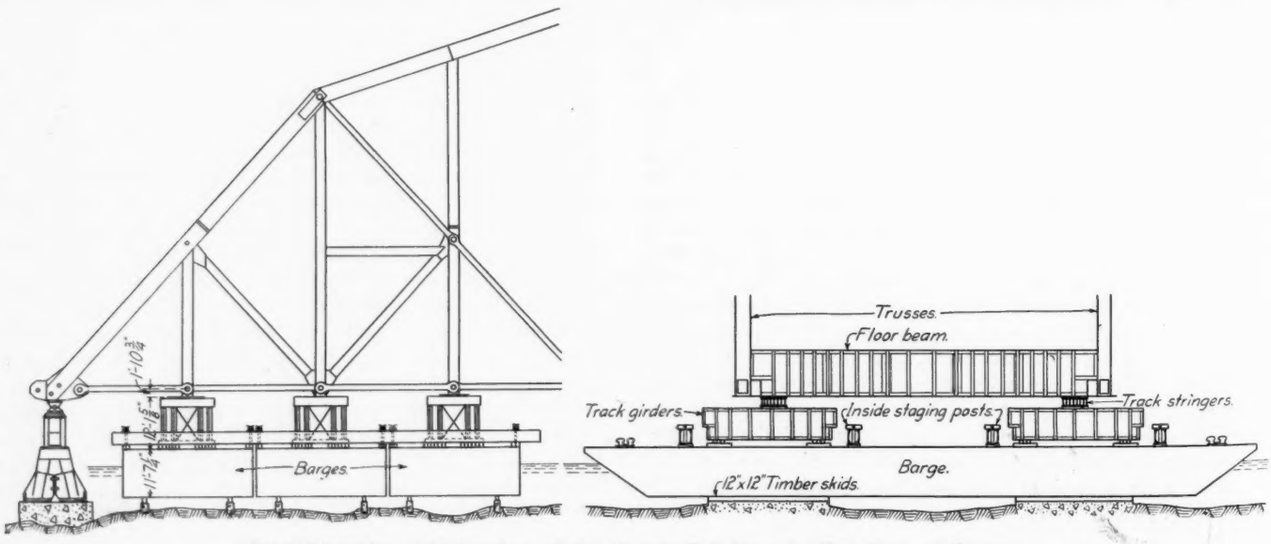
On its first trip the traveler will place the staging, bottom chords, bottom laterals, floorbeams and web members up to the middle or M points, followed by the upper web members, top chords, verticals and top chord sway bracing on the return trip.

After the span has been completely erected on the staging, the intermediate staging supports will be removed and the



TypicalPanel of the Cantilever Arm

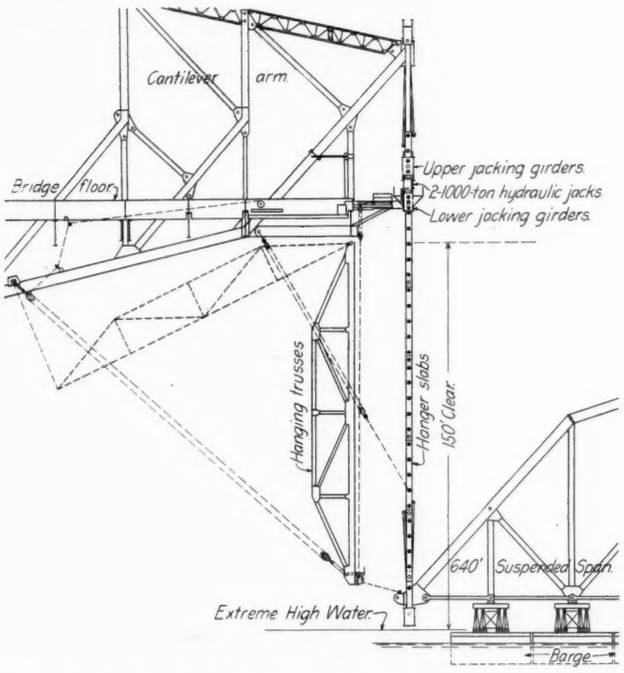
span swung on the end bents at L_0 and L_{18}. In this condition, six scows 32 ft. wide and 160 ft. long with 11 ft. 7 in. draft will be floated in and placed under the panel points L_1, L_2, L_3, L_{15}, L_{16} and L_{17}. The valves in the bottom of the scows will be opened and the scows sunk until they rest on their foundation supports. The cross girders and bracing which transfer the load of the span to the scows, will then be placed. To raise the span from the end supports at L_0 and L_{18}, preparatory to floating out, the scows will be drained at



Part Elevation and Section of the Suspended Span in Position on Barges

low tide and the bottom valves closed. Then as the tide rises the span will be lifted gradually and will be in readiness to proceed on its journey to the bridge site, if the weather and tide conditions are considered favorable.

While the span is being moved to the bridge site, it will be kept under control by means of tugs of sufficient power capacity to overcome all anticipated resistances due to wind or current. Arriving at the bridge site, the span will be anchored to the ends of the hanging trusses shown in one of the accompanying drawings, coupled up to the hanger slabs provided at each of the four corners of the cantilever arms



Method to Be Used for Raising the Suspended Span Into Position

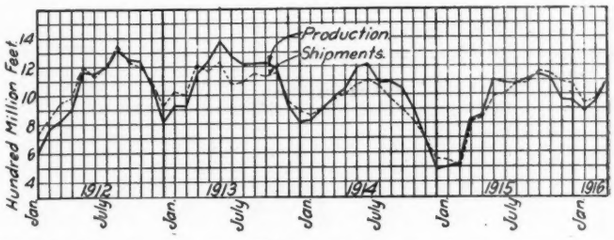
and raised into its final position by means of the movable jacking girders and eight 1,000-ton hydraulic jacks, two at each corner.

The work is being carried out under the supervision of the Board of Engineers, Quebec Bridge, consisting of C. N. Monsarrat (chairman and chief engineer), Ralph Modjeski and H. P. Borden. The St. Lawrence Bridge Company is the contractor for the superstructure, George F. Porter being engineer of construction, W. B. Fortune superintendent and S. P. Mitchell consulting engineer of erection.

VICTORIAN RAILWAYMEN DISSATISFIED.—A correspondent to the Railway Gazette (London) writes: The Victorian railwaymen are apparently not satisfied with the increases of pay granted by the government. The decision to pay the increases allowed as from July 1 last, instead of from the 31st inst., as was at first intended, has met with approval, but the demand, as originally made, for a 9s. ($2.25) minimum wage has not been allowed to drop. There is a large section of railway workers who advocate the establishment of wages boards for the railway service and are insisting on this. The secretary of the Railways Union recently said that the central executive of the union would certainly not advise branches to accept the increases which had been granted as being a just and final settlement of the men's claims. The railway labor unrest is a good argument against those who think that state-owned and controlled systems would be able to eliminate strikes and threats.

LUMBER STATISTICS FOR 1915

The Forest Service of the United States estimates that 37,013,294,000 board feet of lumber was cut in 1915, by 29,941 mills. These figures are based on a total of 30,985,473,000 board feet reported by 16,248 mills. The following tables give the total cuts by states and also the total production of the various kinds of the principal woods as far as the figures are available to date. The cut for yellow pine is the largest, being 14,700,000,000 board feet, and that for Douglas fir comes next with 4,413,000,000 board feet.



Lumber Production and Shipments for the Last Four Years

Since the beginning of February there has been a marked increase in both the shipment and production of lumber in this country. In March, 1916, 951,800,000 feet were cut, as compared with 797,500,000 in March, 1915, and 899,100,000 were shipped in March, 1916, as compared with 748,500,000 in the same month in 1915.

1915 PRODUCTION OF YELLOW PINE

State	Number of mills reporting	Production of mills reporting M ft.	Estimated total number active mills	Estimated total production M ft.
Louisiana	201	2,868,402	300	2,950,000
Mississippi	460	1,630,354	975	1,850,000
Texas	229	1,544,210	350	1,650,000
North Carolina	1,024	1,078,077	2,500	1,700,000
Alabama	557	1,004,499	1,250	1,350,000
Arkansas	350	1,067,853	600	1,190,000
Florida	181	823,270	360	950,000
Virginia	832	493,332	1,650	1,000,000
Georgia	481	523,498	1,400	890,000
South Carolina	356	565,910	750	750,000
Oklahoma	42	160,406	90	170,000
Reported total	4,713	11,759,811	...	.....
Other States	...	.....	1,555	250,000
Estimated total	...	.....	11,780	14,700,000

1915 PRODUCTION OF DOUGLAS FIR

State	Production of mills reporting M ft.	Estimated total production M ft.
Washington	2,754,179	2,920,747
Oregon	1,119,395	1,254,125
California	117,951	119,000
Idaho	76,283	76,700
Montana	41,464	42,400
	4,109,272	4,412,972

PRELIMINARY 1915 FIGURES FOR OTHER WOODS

Hemlock	
Wisconsin	446,584 M
Michigan	362,973 M
Washington	306,570 M
Pennsylvania	256,170 M
West Virginia	132,346 M
New York	93,014 M
Maine	68,631 M
Oregon	61,963 M
	1,728,251 M
Cypress	
Louisiana	559,830 M
Florida	147,079 M
Georgia	47,261 M
South Carolina	30,034 M
Arkansas	24,554 M
Mississippi	23,679 M
Missouri	23,639 M
	856,076 M
White Pine	
Minnesota	884,252 M
Idaho	201,858 M
Wisconsin	188,274 M
	1,374,126 M
Western Pine	
California and Nevada	389,991 M
Idaho	301,600 M
Oregon	189,203 M
Washington	130,507 M
Montana	118,920 M
Arizona	75,843 M
New Mexico	61,466 M
	1,167,788 M
Redwood	
California	418,824 M
Sugar Pine	
California	114,494 M

PETROLEUM AS FUEL IN URUGUAY.—Because of the shortage of coal in Uruguay 50 locomotives of the Great Southern Railway are being modified so as to permit the use of petroleum instead of coal as fuel.

General News Department

At Altoona, Pa., on the 17th of May, 39 boys were arrested on charges of trespassing, throwing stones, and all sorts of malicious mischief along the line of the Pennsylvania Railroad.

The Union Pacific has announced an increase in wages averaging about five per cent to the employees in its shops, effective from May 8. The increase will amount to about $500,000 a year.

With the new time-table going into effect next Sunday, the Pennsylvania Railroad will shorten by seven minutes the running time of local passenger trains between Broad street station, Philadelphia and Paoli, on the Philadelphia division, 20 miles. These trains run half hourly throughout the day, and the increase of speed follows the adoption of electric motive power.

The daylight saving arrangement, prescribed by act of Parliament, was put into effect in Great Britain at 2 a. m., May 20, when the clocks were changed to read 3 a. m. On September 30, according to the law, the clocks will be stopped for one hour, and the normal arrangement thus be restored. This arrangement has now been adopted in most of the countries of northern Europe.

Victor Carlstrom, riding in a Curtiss biplane of 180 horse power, arrived at Sheepshead Bay, New York City, May 20, having flown from Newport News, Va., 400 miles, in four hours. He carried one passenger. The reports of this trip call attention to the fact that at the rate of speed made by Carlstrom, the journey between New York and Chicago could be made in less than 9 hours.

The strike of longshoremen at New York City has been settled, and most of the strikers have returned to work. The rate of pay on the docks of all the coastwise steamships is said to be 35 cents an hour for men working in the day time, 50 cents an hour for night work and 65 cents an hour for work done on Sundays and holidays. It is expected that the Southern Pacific will now remove the embargo which has been placed on shipments eastbound by water from Galveston. The numerous smaller strikes reported from various cities last week appear mostly to have been settled or abandoned.

The Ann Arbor Boat Company, a newly organized corporation with its principal offices at Toledo, Ohio, is building a large car ferry, to cost about $500,000. The boat is about 60 per cent completed, and will be leased to the Ann Arbor Railroad, which is now operating three large ferries on Lake Michigan. The new boat will be 338 ft. long, 56 ft. wide, 20 ft. 6 in. deep from the main deck, and of steel construction. It will carry 32 freight cars averaging 40 ft. in length, which is two more cars than can be carried on the Ann Arbor's Number 5. With the new boat, the Ann Arbor will be able to carry 306 cars a day across Lake Michigan.

The Norfolk & Western has notified employees that, except where important interests of the company may interfere, anyone who wishes to take his vacation this year at Camp Oglethorpe, Ga., for military training, will be allowed a month off, with pay; this as an experiment to see how the matter works out. The company believes that large employers of men ought to encourage military training; but, of course, can reach no satisfactory conclusion until it is seen how many men desire to go to the camps. According to the Knoxville Sentinel, somebody expects that 500 employees of the road will go to Fort Oglethorpe; but an officer of the company informs us that, for the May encampment, only two took advantage of the company's offer; one a man from the general office, and the other a conductor on the Norfolk division. There is to be another encampment in June.

A "National Council of Executive Information" is provided for in a bill introduced in Congress last Tuesday by Representative Hay, chairman of the Military Committee. The council would consist of six members of the cabinet—the secretaries of War, Navy, Interior, Agriculture, Commerce and Labor—and it would nominate, for appointment by the President, an advisory commission of seven persons, to serve without pay, who should advise the executive department of the government concerning national industries and resources which ought to be available in time of war. The advisory commission would gather information and report as to the location of railroads with reference to the frontiers; as to mobilization of military and naval resources, the increase of domestic production of necessary articles, and methods of concentration and utilization necessary in preparing for war or defense. Subordinate bodies of special investigators would be established, these also to serve without pay.

Correction

In the report of the reclamation committee of the Railway Storekeeper's Association, an error appears in the amount of $48,273.85 at the top of page 1097 in the issue of May 19, 1916. This amount is the total for the year and should be divided by 12 to give the monthly average.

A Station Agent of A. D. 1843

Judge Oliver C. Gephard, of Cumberland, Md., who died at his home in that place May 19, at the age of 98, was present at the laying of the corner stone of the Baltimore & Ohio Railroad at Baltimore, in 1828; and when that road was completed to Cumberland, in 1843, he was appointed station agent there. He held that position until about the beginning of the Civil War. Subsequently he engaged in mercantile business and amassed a fortune. He was an uncle of Mrs. A. W. Thompson, wife of the third vice-president of the Baltimore & Ohio.

Railway Earnings and Expenses, March, 1916

Net operating income of the railways of the United States for March, according to the monthly bulletin of the Bureau of Railway Economics, increased $118 per mile, or 48.4 per cent, as compared with March, 1915. Comparing March, 1916, with the average March of the preceding five years, the increase was 45.4 per cent.

Total operating revenues amounted to $289,176,150, an increase over 1915 of $57,720,345. Operating expenses were $193,643,319, an increase of $29,055,642. Net operating revenue amounted to $95,532,831, an increase of $28,664,703. Taxes amounted to $12,374,477, an increase of $1,183,377. This left $83,101,002 net operating income available for rentals, interest on bonds, appropriations for improvements and new construction, and dividends. Operating revenues per mile averaged $1,260, an increase of 24.1 per cent; operating expenses per mile averaged $844, an increase of 16.8 per cent; net operating revenue per mile averaged $416, an increase of 41.9 per cent, while net operating income per mile was $362, an increase of 48.4 per cent. Taxes per mile increased 9.8 per cent. Railways operating 229,428 miles of line are covered by this summary, or about 90 per cent of the steam railway mileage in the United States.

Operating revenues of the Eastern railways per mile show an increase of 27.4 per cent as compared with March, 1915; operating expenses increased 20.4 per cent, net operating revenue increased 47.3 per cent, and taxes increased 7.1 per cent. Operating income increased 56.0 per cent. Comparison of March, 1916, with the average March for five years past shows an increase of 55.1 per cent.

Operating revenues of the Southern railways per mile increased 21.5 per cent, operating expenses increased 11.7 per cent, net operating revenue increased 44.7 per cent, and taxes increased 15.1 per cent. Operating income increased 49.8 per cent. Comparing March, 1916, with the average for five years past, the increase was 36.8 per cent.

Operating revenues of the Western railways per mile show

REVENUES AND EXPENSES OF STEAM ROADS—MARCH, 1916.

Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, *i. e.*, roads with annual operating revenues above $1,000,000.

Account.	United States				Eastern District				Southern District				Western District			
	Amount, March, 1916	Per mile of line		Increase over 1915 Per cent	Amount, March, 1916	Per mile of line		Increase over 1915 Per cent	Amount, March, 1916	Per mile of line		Increase over 1915 Per cent	Amount, March, 1916	Per mile of line		Increase over 1915 Per cent
		1916	1915			1916	1915			1916	1915			1916	1915	
Total operating revenues	$289,176,150	$1,260	$1,015	24.1	$130,758,597	$2,219	$1,742	27.4	$44,776,063	$1,055	$867	21.5	$113,641,490	$887	$728	21.8
Freight	211,791,600	923	717	28.7	95,638,008	1,623	1,237	31.3	33,686,209	793	645	23.0	82,467,383	644	501	28.6
Passenger	50,686,875	221	204	8.4	21,831,652	371	335	10.6	7,722,809	182	158	14.7	21,132,414	165	158	4.4
Mail	5,139,206	22	21	7.7	1,993,066	34	29	15.3	637,404	15	15	1.1	2,508,736	19	19	4.2
Express	7,065,626	31	23	33.3	3,358,494	57	38	48.8	1,087,669	26	19	36.3	2,619,463	20	17	16.9
All other	14,492,843	63	50	24.2	7,937,377	134	103	30.5	1,641,972	39	30	25.9	4,913,494	39	33	15.4
Total operating expenses	193,643,319	844	722	16.8	91,475,989	1,553	1,290	20.4	28,894,639	681	609	11.7	73,272,691	572	497	15.1
Maintenance of way and structures	32,501,656	142	114	24.0	13,735,112	233	188	24.1	5,058,904	119	113	5.3	13,707,640	107	80	32.9
Maintenance of equipment	49,602,884	216	183	18.1	23,873,163	405	343	18.3	8,117,360	191	157	21.6	17,612,361	137	118	16.8
Traffic	5,000,698	22	21	0.8	1,865,681	32	31	0.8	950,082	22	21	6.3	2,184,935	17	17	d 1.1
Transportation	98,189,452	428	370	15.8	48,154,798	817	669	22.2	13,536,538	319	292	9.0	36,498,116	285	257	10.9
General	6,683,296	29	28	5.8	2,925,120	50	46	7.1	1,094,593	26	23	11.0	2,663,583	21	20	2.8
All other	1,665,333	7	6	18.1	922,115	16	13	21.7	137,162	4	3	32.7	606,056	5	5	11.0
Net operating revenue	95,532,831	416	293	41.9	39,282,608	666	452	47.3	15,881,424	374	258	44.7	40,368,799	315	231	36.2
Taxes	12,374,477	54	49	9.8	5,063,470	86	80	7.1	1,817,165	43	37	15.1	5,493,842	43	39	11.0
Uncollectible revenues	57,352	*	*	....	22,693	*	*	....	10,643	*	*	....	24,016	*	*	....
Railway operating income	83,101,002	362	244	48.4	34,196,445	580	372	56.0	14,053,616	331	221	49.8	34,850,941	272	192	41.4
Operating ratio—per cent—																
1916		67.0				70.0				64.5				64.5		
1915		71.1				74.0				70.2				68.2		
Average mileage represented—																
1916		229,428				58,912				42,458				128,056		
1915		227,848				58,780				42,026				127,042		

*Less than one dollar. d Decrease.

an increase of 21.8 per cent, operating expenses increased 15.1 per cent, net operating revenue increased 36.2 per cent, and taxes increased 11.0 per cent. Operating income increased 41.4 per cent. Compared with the average for five years past, operating income for March, 1916, increased 40.9 per cent.

The nine months of the current fiscal year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 15.3 per cent, operating expenses increased 6.3 per cent, net operating revenue increased 36.8 per cent, taxes increased 6.9 per cent, and operating income increased 42.4 per cent.

Operating income per mile increased 60.5 per cent in the East, increased 51.5 per cent in the South, and increased 25.5 per cent in the West.

March operating income per mile was 48.4 per cent greater in 1916 than in 1915, 50.9 per cent greater than in 1914, 54.3 per cent greater than in 1913, and 39.1 per cent greater than in 1912.

Santa Fe Trainmen Propose to Withdraw from Wage Movement

About 60 members of the engineers', conductors', firemen's and trainmen's brotherhoods employed on the Atchison, Topeka & Santa Fe, recently held a meeting at Albuquerque, and discussed a plan to have Santa Fe employees withdraw from the nation-wide movement of the brotherhoods for the eight-hour basic day and time and one-half for overtime. Those who attended the meeting stated that they are opposed to the proposition in its present form, and they appointed a committee to circularize all members of the four brotherhoods employed on the Santa Fe and urge them to take up the subject at meetings of their local lodges to ascertain whether the majority are in accord with the movement. The circular sent out said, in part: "We think the movement unreasonable and unjust, and we are of the opinion that we could get a schedule from the managers of the Santa Fe that would be more beneficial to the Santa Fe men than to remain in this movement. We want to put this proposition up to each lodge, and are taking this means to ascertain if it is possible for the Santa Fe men to withdraw from the movement. We think there should be some way for the Santa Fe men to withdraw, provided the majority so rule."

Across the Continent by Automobile in 6 1-2 Days

Robert Hammond, driving an Empire automobile, arrived in New York City, May 23, from San Francisco in six days, ten hours, 59 minutes, having begun his trip at 12:01 a. m. May 17. Hammond says that the distance covered was 3,941 miles, which is greater by several rundred miles than the distance covered by E. G. Baker in his trip from Los Angles, reported last week, page 1103; and the time is fully 24 hours less than the time made by Baker. Baker had been delayed by muddy roads and by an accident to his lubricating apparatus. Hammond reported dellays by running off the road and by a collision, which, he thinks, was purposely imposed on him. He stopped on the road for sleep an aggregate of ten hours. Baker reported that he had slept 19 hours. Hammond's route was by way of Oakland, Truckee, Ogden, Cheyenne, Omaha, Clinton, Ill., Fort Wayne, Ind., Lima, O., Pittsburgh and Philadelphia. He says that he ran from San Francisco to Ogden, 917 miles, in 36 hours, with no important delays. On Saturday, May 20, he traveled about 700 miles in 17 hours.

The Black Diamond Express

The Black Diamond Express of the Lehigh Valley, running through between Jersey City and Buffalo, 447 miles, in 11 hours, 10 minutes, has now been an institution of that road for 20 years, having made its first trip on May 18, 1896. At the beginning the train consisted of a locomotive and four cars, the heaviest car weighing 110,900 lb. The locomotives then used weighed about 58 tons. At the present time the train is made up of seven cars, all steel, and each 72 ft. long. The dining car and parlor car weigh 151,000 lb. each. There are now three engine divisions, instead of five as in 1896, and the engines now used are monsters; the heaviest one weighs 131 tons. Of the enginemen originally assigned to the trains, four are still in active service, two have been promoted and five have left the service. One of the runners, Thomas Farley, is still on the same run and has missed scarcely a trip. The three original conductors are still running the train.

R. S. A. Stated Meeting

The Railway Signal Association held its second stated meeting of the year in the Hotel Astor, New York, on Wednesday and Thursday of this week. Two business sessions were held each day, with President W. J. Eck (Southern) in the chair. At the Wednesday morning session, Committees I and II presented reports for discussion.

Committee I on Signaling Practice submitted a revised statement of the purposes of and the requisites of installation for switch indicators, and a second installment of the analysis of location of passing sidings on single track. In undertaking a revision of the matter now in the Manual referring to switch indicators, to make it apply to single as well as to multiple-track roads, the committee concluded to make a simple statement of the uses of switch indicators rather than to cast the statement in the form of an application of the adjunct in the Standard Code of Block Signal rules, particularly since this code has recently been revised and further change might not be expedient. The committee proposes to carry this statement to the annual convention for adoption. The analysis of location of passing sidings was submitted as information.

The report was accepted with little discussion.

Committee II on Mechanical Interlocking presented its revision of the specifications for mechanical interlocking; revised drawings 1,400 and 1,402—Leadaways—turns in pipe lines, etc.; and specifications for electro-mechanical interlocking. All of these matters are intended for presentation to the annual convention for approval and submission to letter ballot as matter to be inserted in the Manual.

W. H. Elliott (N. Y. C.), in discussing the mechanical specifications, called attention to the desirability of using 7-ft. instead of 8-ft. spacing between pipe carriers. Other members felt, however, that with the usual high standard of mechanical work at present and the lighter loads that are being placed on levers, there is no serious objection to the 8-ft. spacing included in the revised specification. At Mr. Elliott's suggestion the committee agreed to change the paragraph on gage plates to allow lag screws or screw spikes, but not cut spikes, to be used for fastening them to ties.

In discussing the electro-mechanical specifications, a number of members urged the desirability of using more than three gage plates as required. It was finally voted to make this "not less than three." A number of features in the specifications were discussed which are at present in the electric interlocking specifications, and unless some joint action between Committees II and III can be taken in time to prepare a report on these points for the annual convention, the clauses will be allowed to remain as they now exist, to be revised later with the corresponding clauses in the existing specification for electric interlocking.

At the afternoon meeting on Wednesday, reports were presented by Committee IV and the Special Committee on Electrical Testing. A paper by C. F. Estwick on an Analytical Method of Solving Track Circuit Problems was also presented.

Committee IV on D. C. Automatic Block Signaling submitted for discussion: Revised specifications for capping and grooved trunking; revised specifications for d.c. automatic block signals—low voltage; specifications for the installation of fibre and metal conduit system; and a report on the results of a canvass covering 45 railroads to ascertain the kinds of line wire used in low-voltage automatic block signal construction work and the reasons therefor. The three specifications were recommended for presentation to the annual convention. The study on current use of line wire led the committee to recommend as good practice: All wire should be either copper or copper clad; all copper wire should be not smaller than No. 10 B. & S. gage; all copper-clad wire should be not smaller than No. 12 B. & S. gage; copper-clad wire should be of 40 per cent conductivity; insulated wire should be double-braid, in accordance with R. S. A. specifications; iron wire should not be used where it will be subjected to injurious gases or salt in the atmosphere; the common wire should have a conductivity not less than the equivalent of No. 10 B. & S. gage copper-clad wire, 40 per cent conductivity, and in any case, should not have a conductivity less than that of the control wires. This recommendation was submitted as information.

The report on the use of line wire brought out considerable discussion on the advisability of using iron wire. Mr. Elliott referred to the satisfactory use of iron on the New York Central since 1910, where it has been found economical on the basis that insulated wire will be renewed at the end of the life of the insulation. In normal-danger circuits this economy is marked.

The special committee on Electrical Testing submitted a sketch illustrating two methods of relay post numbering and requested an expression by letter ballot on five questions: 1. Should relay posts be marked? 2. Should the letter scheme be used? 3. Should the number scheme be used? 4. Should corresponding numbers or letters be shown on the wire tag in relay box? 5. Should the committee include such tagging in the general plan?

The report was accepted with little discussion.

Through the courtesy of the Signal Appliances Association, a dinner was arranged for members of the two associations and their guests at Murray's Restaurant on Wednesday evening, and after dinner the party attended a performance at the New York Hippodrome.

The M. C. B. and M. M. Conventions

The program of the convention of the Master Car Builders' Association at Atlantic City, beginning June 14, includes the presentation of committee reports of the standing committees on Arbitration, Standards and Recommended Practice; Train Brake and Signal Equipment; Brake Shoe and Brake Beam Equipment; Couplers; Loading Rules; Car Wheels; Safety Appliances; Car Construction, and Specifications and Tests for Materials. Reports will be received from the special committees on Car Trucks; Prices for Labor and Material; Train Lighting and Equipment; Tank Cars; Settlement Prices for Reinforced Wooden Cars; Draft Gear, and Welding of Truck Side Frames and Bolsters.

At the convention of the Master Mechanics' Association, beginning June 19, committee reports will be presented by the standing committees on Standards and Recommended Practice; Mechanical Stokers, and Fuel Economy and Smoke Prevention; and by the special committees on Design and Maintenance of Locomotive Boilers; Locomotive Headlights; Superheater Locomotives; Equalization of Long Locomotives; Dimensions of Flange and Screw Couplings for Injectors; Design, Maintenance and Operation of Electric Rolling Stock; Best Designs and Materials for Pistons, Valves, Rings and Bushings; Co-operation with Other Mechanical Organizations; Powdered Fuel; Specifications and Tests for Materials; Train Resistance and Tonnage Rating, and Modernizing of Existing Locomotives.

The chairman of the entertainment committee of the Railway Supply Manufacturers' Association announces that euchre parties for the ladies will be held Thursday and Tuesday. The ladies' committees in charge have Mrs. D. R. McBain as chairman the first week, and Mrs. E. W. Pratt as chairman for the second week. Prizes will be offered. Players will be identified by their badge numbers.

The president of the Railway Supply Manufacturers' Association, Oscar F. Ostby, announces that the executive office of the association will be opened on the pier May 29, at which time certain spaces will be ready for the installation of exhibits. According to official circular No. 2, exhibit booths will be ready for occupancy as follows: Exhibition Hall, May 29; under west balcony of Main Building, June 9; all others June 6, except spaces on runways used for trucking, which spaces will be available in ample time. The pier authorities have advised that preparations are progressing excellently, and that everything will be ready four or five days in advance. All exhibitors are urged to get their exhibits on the way as soon as possible, so that there may be no danger of delay because of the freight congestion.

National Association of Corporation Schools

The fourth annual convention of the National Association of Corporation Schools will be held at Pittsburgh, May 30, 31, June 1 and 2, with headquarters at the School of Applied Design, Carnegie Institute of Technology. The program of the meeting is as follows:

Tuesday morning, 10:15 *a.m.*—Address of welcome by Hon. James Francis Burke; response and annual address by President McLeod. Reports of the committees on Allied Institutions, James A. Roosevelt, chairman, and Public Education, E. H. Fish, chairman.

Tuesday afternoon, 2:00 *p.m.*—Reports of the committees on Trade Apprenticeship Schools, J. W. L. Hale, chairman, and Special Training Schools, J. W. Dietz, chairman.

Tuesday evening, 7:30 *p.m.*—Round table—Trade Apprenticeship Schools and round table—Special Training Schools. Meeting of executive committee.

Wednesday morning, 9:00 *a.m.*—Reports of the committees on Codification, Harry Tipper, chairman, and Vocational Guidance, Dr. Henry C. Metcalf, chairman.

Wednesday afternoon, 2:00 *p.m.*—Reports of the committees on Advertising, Selling and Distribution Schools, Dr. Lee Galloway, chairman, and Retail Salesmanship, James W. Fisk, chairman.

Thursday morning, 9:00 *a.m.*—Reports of the committees on Office Work Schools, George B. Everitt, chairman, and Employment Plans, F. P. Pitzer, chairman.

Thursday afternoon, 2:00 *p.m.*—Reports of the committees on Safety and Health, Sydney W. Ashe, chairman, and Unskilled Labor, J. E. Banks, chairman.

Thursday evening, 7:30 *p.m.*—Banquet at Hotel Schenley. Toastmaster, Herbert J. Tily; speakers, John A. Brashear and F. M. Herr.

Friday morning, 10:00 *a.m.*—Report of Nominating Committee; election of officers; report of Committee on Resolutions and other business. Round tables: Office Work Schools and Employment Plans; Safety and Health and Unskilled Labor.

Western Railway Club

The annual meeting of the Western Railway Club was held at the Grand Pacific hotel, Chicago, on Tuesday evening, May 16. Besides the usual "get together" dinner, the evening program included an address by S. O. Dunn, editor of the *Railway Age Gazette,* on "Government Regulation of Railroad Operation." The entertainment this year was the presentation of "The Passing Show," an amusing take-off on current political and diplomatic entanglements. The election of officers for the ensuing year resulted as follows: For president, W. E. Dunham, Chicago & North Western; first vice-president, A. R. Kipp, Minneapolis, St. Paul & Sault Ste. Marie; second vice-president, A. La Mar, Pennsylvania Lines West; executive members, G. A. Goodwin and E. G. Chenoweth, Chicago, Rock Island & Pacific, and George Thompson, New York Central. The secretary reported that during the past year the club had gained 300 members, including 70 from the Chicago & North Western; 33 from the Chicago, Burlington & Quincy; 26 from the Minneapolis, St. Paul & Sault Ste. Marie; 20 from the Rock Island, and 12 from the Chicago, Milwaukee & St. Paul.

Railway Business Association

The Railway Business Association has recently enrolled the following new members: Thomas A. Edison, Inc., Orange, N. J.; Clark Witbeck Co., Schenectady, N. Y.; Greenville Steel Car Company, Greenville, Pa.; Century Coal Company of W. Va., Baltimore, Md.; Dahlstrom Metallic Door Company, Jamestown, N. Y.; Linde Air Products Company, New York; Union Carbide Sales Company, New York; Gardner Governor Company, Quincy, Ill.; King Bridge Company, Cleveland; Bethlehem Steel Company, South Bethlehem, Pa.; Lackawanna Bridge Company, Buffalo, N. Y.; Seneca Iron & Steel Company, Buffalo; Crane Company, Chicago; American Car & Foundry Company, New York; Ludlow Valve Mfg. Company, Troy, N. Y.; German-American Car Company, Chicago, Ill.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings, and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, June 26, 1916, Boston, Mass.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June 20-23, 1916, Cincinnati, O.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June 19, 1916, Atlantic City, N. J.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Annual meeting June 27 to 30, Hotel Traymore, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesdays in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8, Woodward Bldg., Washington, D. C. Annual meeting, June 28, 1916, Hotel Statler, Detroit, Mich.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October, 1916, Chicago.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Semi-annual meeting, June 16, 1916, Hotel Denis, Atlantic City, N. J.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Soo Line, 112 West Adams St., Chicago. Annual meeting, June 20-22, 1916, St. Paul, Minn.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, June 27-28, Boston, Mass.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Annual meeting, June 14, 1916, Atlantic City, N. J.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings, October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 20, 1916, Toronto, Ont.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's Office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

H. D. Driscoll, late of Topeka, Kan., is the head of the traffic department of the Chamber of Commerce of Waco, Tex.

The Lehigh Valley announces that it has appealed to the United States Supreme Court from the decision of the lower court, requiring the company to divorce its lake steamboat line.

The Heavy Haulage Company of New York City reports having carried from New York to Hartford, Conn., about 150 miles, in eight five-ton Mack automobile trucks, a shipment of 44 tons of steel castings, making the trip in about 30 hours, despite bad roads over a portion of the way.

It is announced in Philadelphia that barges to be run daily for carrying freight between that city and New York by way of the Delaware and Raritan Canal, are to be put in service next week. This venture is looked upon as a hopeful one by reason of the great congestion of freight traffic on the railroads at the present time.

The steamers "Massachusetts" and "Bunker Hill," of the Metropolitan Line, running between New York and Boston, now pass through the Cape Cod Canal, thus shortening their journey 77 miles. The Cape Cod canal, eight miles long, was opened two years ago, with a depth of water of 15 feet. One year ago it had a depth of 18 feet.

In the United States District Court at Toledo, Ohio, May 18, indictments for discrimination in failing to collect demurrage on cars of coal were returned against the Kanawha & Michigan, the Hocking Valley and the Toledo & Ohio Central railroads; and, also, in connection with the same offenses, against the Kelley's Creek Colliery Company, 25 counts.

The embargoes on carload freight destined to Bridgeport, Waterbury, Hartford and Torrington, Conn., were modified May 20, and as regards most commodities are now entirely lifted. The New Haven road is now receiving anthracite coal from all of its connections to the extent of 50 per cent of the average daily receipts from such connections during the month of May last year.

The Uniform Bill of Lading Committee, C. C. McCain, chairman, announces that the change in the printed conditions on the bill of lading, section 3, paragraph 3, lengthening the time within which claims for loss or damage may be presented, will go into effect June 1. Under this change claims may be made within six months after the delivery of property, or in case of failure to make delivery, then within six months after a reasonable time for delivery has elapsed; but on export traffic the time will be 9 months after delivery at the port of export. This action affects bills of lading throughout the territory of the Trunk Line Association, the New England Freight Association and the Central Freight Association.

TELEPHONES IN JAPAN.—F. B. Gleason, general telephone sales manager of the Western Electric Company, who recently returned from Tokio, where he had been far eastern manager, makes some interesting comments in the May Western Electric News on Japanese telephones. "The telephone business in Japan is run by the government, and its development has been slow, although it appears that the demand for telephones is far greater than the service offered. For example, the number of telephone stations in Japan is 200,000, while there are no less than 130,000 applications awaiting connections. In the regular course of events an applicant must wait several years before he is given telephone service unless he secures it by making an additional payment. The reason for the apparent lethargy in telephone development is a scarcity of government funds. In recent years, the cabinets have not been able to pass a government budget for extraordinary expenditures (under which head telephone development falls), and as a result these cabinets endure for a short period and resign, and new cabinets are formed and the cycle is repeated. The present cabinet has passed a budget for 1916 that will permit of a rapid advance in telephone development."

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The hearing announced by the commission to be held on the question of prescribing rules for the guidance of railroads in connection with the law forbidding them to purchase supplies from their own directors, etc., has been postponed to June 19.

The Delaware, Lackawanna & Western Coal Company has presented to the commission a claim for reparation totalling $889,771 which is claimed to be due the coal company from the Lackawanna Railroad for excessive charges on shipments of anthracite coal to points in New York, New Jersey and other states. The claim is an outcome of the Anthracite Rate case, in which the coal rates on prepared sizes to tidewater and other eastern points were declared unreasonable.

Rates on Lumber from Leesville, Fla.

Nona Mills Company, Ltd., v. Kansas City Southern et al. Opinion by Commissioner Clark:

Joint rates on lumber from Leesville, La., by way of the Kansas City Southern and the Gulf, Colorado & Santa Fe, to points on the lines of the Santa Fe system, in Texas and Oklahoma, are found to be discriminatory to the extent that they exceed the rates from points on the lines of the Gulf, Colorado & Santa Fe, in Louisiana, to the same points. (39 I. C. C., 126.)

Rates on Brick

Duffney Brick Company et al. v. Boston & Maine. Opinion by Commissioner Clark:

Increased local rates on brick from Mechanicville and Lansingburgh, N. Y., and from Gonic, N. H., to Boston, Mass., and adjacent territory, are found justified. The record is held open to permit subsequent hearing as to joint rates on brick from Gonic to other territories which are alleged to be unreasonable and discriminatory. (39 I. C. C., 118.)

Rates on Lumber from Eastern Oregon

Eastern Oregon Lumber Producers' Association v. Chicago, Burlington & Quincy et al. Opinion by Commissioner Hall:

Combination rates on lumber and articles taking lumber rates from eastern Oregon producing points on the Oregon-Washington to points on the Northern Pacific and Great Northern, and their connections in Montana, North Dakota, South Dakota, Minnesota, and Nebraska, found unreasonable and prejudicial, and joint rates based on differentials over the rates from Spokane, Wash., are prescribed for the future. (39 I. C. C. 316.)

Rates on Iron and Steel from Perth Amboy, N. J.

C. Pardee Works v. Central of New Jersey et al. Opinion by Commissioner Harlan:

For the purpose of making rates on scrap iron and on billets, bars, and other iron and steel articles to and from the New England States, Perth Amboy is in a group extending from Jersey City on the east to the Susquehanna River on the west. In its original report in this case (29 I. C. C., 500) the commission found that this arrangement was satisfactory, but upon rehearing it is now held that the rate adjustment gives to the more distant competitors of the complainant in the same group an undue disadvantage. (39 I. C. C., 162.)

Import Rates on Clay

In the matter of import and domestic rates on clay. Opinion by Commissioner Clark:

Because of informal complaints filed with the commission to determine the propriety of the import rates on English clay from gulf ports and north Atlantic ports to points in central freight association territory, which were lower than the domestic rates on clay mined in the state of Georgia to the same

destinations, a hearing was had under a general order of the commission which provides for an investigation into the rates, practices, rules and regulations governing the transportation of imported property and the relationship between the rates for such transportation and for transportation of similar property originating in the United States; as far as the rates on clay are concerned the commission holds that the present adjustment has not been shown to be discriminatory against domestic traffic. (39 I. C. C., 132.)

STATE COMMISSIONS

The New York State Public Service Commission, Second district, has denied the application of about 60 individual proprietors for certificates to run "jitney busses" on 14 routes in Rochester. These applicants proposed to run about 136 carriages on lines substantially parallel to street car lines; and the commission holds that this would be an unreasonable competition as related to the street car company; but the report on the applications contains the results of a detailed investigation of the service of the street railway company in Rochester and calls for important improvements, and the removal of causes of delays. The commission demands that these recommendations for improvement of the service be carried out without delay, and if this demand is not met, then the commission will look with more favor on the applications of the jitney proprietors.

COURT NEWS

No Liability for Damage to Crops from Trespassing Animals Through Failure to Fence

The Oklahoma Supreme Court holds that a railroad is not liable to one owning or occupying land adjoining the right of way for damages to crops incurred from trespassing animals entering on said land because of the failure of the railroad to properly fence its right of way.—Box v. Rock Island (Okla.) 155 Pac., 1144.

Injuries to Switchman—Proximate Cause

During switching operations a string of cars was let down against those on which a switchman was riding, without a switchman to control the movement of the last car, contrary to the railroad's rules. The cars were not moving at an excessive speed and the impact was not unusual. The switchman, who was standing on the brake platform of a car, was crushed between the running boards of the cars. In an action for his injuries, the Texas Court of Civil Appeals held that the railroad's negligence was not the proximate cause of the injuries and therefore did not warrant recovery.—Southern Pacific v. Evans (Tex.) 183 S. W., 117.

Wisconsin Headlight Statute Held Valid

The Wisconsin headlight statute of 1915 provides that every locomotive, except those used exclusively for switching and yard service, shall be equipped with a headlight that in clear weather will throw a light which will enable the engineman to discern a man-sized object at a distance of 800 feet in the nighttime. A violation of the act is made a misdemeanor, and the offender is liable for all damages resulting from the violation. The Wisconsin Supreme Court, in an action for damages under the statute, holds that it is not unreasonable or indefinite, that the exception of engines used exclusively for switching and yard service is based on a reasonable classification, and the statute is within the police power of the Legislature.—(Randall v. Minneapolis, St. Paul & S. S. M. (Wis.) 156 N. W., 629.

Contributory Negligence of Caretaker of Stock

A drover was accompanying a car of stock under a contract with the railroad which provided that he should stay in the caboose while the train was in motion and that he should pass along the train or tracks at his own risk. He was struck and killed by a passenger train while standing or walking beside the freight train, which was on a siding waiting for the other train to pass. There was not sufficient room for him to stand between the two trains. It was impossible for the engineman of the passenger train to see him until too near to stop his train, which was running 47 miles an hour. The passenger train whistled in the usual way, and it was ordinarily possible to hear a train running at that rate a quarter of a mile away. In an action for the stockman's death, the Iowa Supreme Court held that he was guilty, as a matter of law, of contributory negligence, barring recovery.—Oaks v. Rock Island (Iowa) 156 N. W., 740.

Parallel and Competing Lines—Effect of Decree

In a suit in equity by the United States against the New York, New Haven & Hartford, the New York Central & Hudson River and the Rutland railroads, and others, under the Sherman Anti-Trust act, the government sought to dissolve the combination, existing under the control of the New Haven Company, and asked that its purchase from the New York Central of stock in the Rutland, being one-half of a controlling interest, and its agreement to purchase a like additional amount be declared illegal, and that it be enjoined from further holding such stock, and compelled to sell it. The New York Court of Appeals holds that a decree divesting the New Haven of the control of certain roads, but not mentioning the Rutland, providing that, except when further orders were contemplated by it or necessary to carry it into effect, it should be the final determination of all relief against the defendants, established that the New Haven was no longer a parallel and competing line with the Rutland, and that its ownership of stock therein was not a violation of the act.—Delaware v. New Haven (N. Y.), 110 N. E., 763.

Telegraph Line on Railroad Right of Way

The Circuit Court of Appeals, Eighth Circuit, holds that a railroad company has the exclusive right to the use of its right of way for telegraph purposes as well as for railroad purposes, and if, after the application of so much of the use thereof as the maintenance of its own railroad and telegraph requires, there remains a surplus use of that right of way, it may lease that use for any purpose which does not interfere with its operation of its own railroad and telegraph. This right to lease is its private property. In proceedings by a telegraph company to condemn right of way, the compensation to which the railroad is entitled is not limited to the damages it will sustain in the operation of its railroad, but includes also the value to it of the use taken, for telegraph as well as for railroad purposes; and where the right to such use has been and may be leased for a substantial rental, evidence to show its rental value is admissible as a basis for determining what is just compensation for its taking.—Northern Pac. v. North American Telegraph Co., C. C. A., 230 Fed. 347.

Leaving Cars on Team Tracks on Streets

In an action for injuries, charged to have been caused plaintiff by riding in his automobile at night into a freight car left by the defendant railroad on its track in a street in violation of a city ordinance, the question whether the car was left standing for temporary work, in which case there was no violation of the ordinance, was held by the Texas Court of Civil Appeals to be for the jury, where the evidence showed that the car was placed on the track on the day of the accident (which occurred at 11:30 p. m.), that it had been loaded with gravel, and was placed there for unloading, and was unloaded that day. The jury found in the affirmative. The court held that it is not negligence per se for a railroad which operates a team track located along one side of a street served with electric arc lights, to leave a freight car on the track for unloading by the consignee, and, in the absence of notice that the car has been unloaded, to permit it to remain on the street during the following night, where the usual time allowed for unloading is 48 hours, and sometimes the work is completed in the night. Acts or omissions cannot be said to be negligence per se unless in violation of law, or so opposed to the dictates of common prudence that the minds of ordinary men cannot differ as to the conclusions to be drawn therefrom.—Galveston, Harrisburg & San Antonio v. Marti (Tex.) 183 S. W. 846.

State Regulation of Logging Trains Invalid

The federal safety appliance act, giving Congress power to regulate interstate commerce, declares that nothing in the act shall apply to trains composed of four-wheel cars, or trains composed of eight-wheel standard logging cars, where the height of

the couplers of such car from the top of the rail to the centre of the coupling does not exceed 25 inches, or to locomotives used in hauling such trains, when such cars or trains are used exclusively for the transportation of logs. The journals of Congress show that the exception as first offered was intended to prevent regulations from requiring reshipment of coal loaded on mine cars, and that it was later extended to ordinary logging trains. The Texas safety appliance act, declaring that it shall apply only to carriers engaged in intrastate commerce, purports to regulate the brakes on logging trains, etc. In an action for penalties for violation of the State statute, the Texas Court of Civil Appeals holds that as to a railroad engaged in interstate commerce the state laws are inoperative; Congress clearly showing by the exception that no regulation of logging trains should be made by the states. The court took judicial notice that practically all the railroads in the state of Texas are engaged in interstate commerce.—State v. Beaumont & Great Northern (Tex.) 183 S. W. 120.

State Commission Cannot Order Reparation for Overcharges

A case removed from the New Mexico State Corporation Commission to the State Supreme Court involved the question of the commission's power to award reparation to shippers in cases where the commission found that the rate charged had been excessive. After the shipper, a mining company, had shipped over the Santa Fe lines divers large quantities of coke, the railroad voluntarily reduced its tariff on carload lots of coke, originating at Koehler and Gardiner, to a figure which the commission judged to be a reasonable rate. The commission further found that the former rate charged was excessive and unreasonable to the extent of 35 cents a ton on shipments of coke in carload lots, and that there had been an overcharge of $2,049.55 on the coke shipped by the mining company. It thereupon assumed the power to award reparation to the shipper, and ordered the railroad to pay back the overcharge. The railroad claimed that the commission had no power or jurisdiction to do so. The question was: Had any such power been granted by the state constitution? Section 7 of article 11 thereof gives the commission power to fix, determine, supervise, regulate and control all charges and rates of railroad and other common carriers within the state, to change such rates, to change its orders and to enforce them and to determine any question given to it therein. No case was found by counsel or the court which was in point. It assumed that the constitution might have provided for the award of reparation by the commission, but it simply held that it did not so provide, and it would be going far afield to say that any such power was impliedly warranted by the terms employed. It therefore ordered that the judgment of the commission be not enforced.—Santa Fé Gold & Copper Mining Co. v. Atchison, T. & S. F. (N. Mex.) 155 Pac. 1093.

Trespassers Within Yards Not Entitled to Statutory Signals

Reversing its former opinion (152 N. W., 961), the Michigan Supreme Court holds that a trespasser on a right of way within the yard limits, where switching operations were frequent at a point which he reached only by passing over cattle guards at street crossings, is not within the class for whose benefit the statutory signals by whistle and bell are required. There were warning signs at each of the street crossings. It was held that there could be no recovery for the death of such a trespasser though the train which killed him was operated without lights, and no whistle was blown nor bell rung. . . . Knowledge by railroad employees of the public's use of the yard did not impose liability. "The report of the Interstate Commerce Commission," the court said, "shows that for the year ending June 30, 1914, 5,471 men, women and children lost their lives in the United States while trespassing upon railway tracks and cars, and that in the same period 6,354 other men, women and children were injured in the same manner. The custom of our citizens to use the private rights of way of steam railroads as footpaths is extremely common. Railroad companies are practically helpless so far as preventing such use is concerned. The inferior employees of every railroad know of such use, and if the duty to maintain a lookout and operate trains with reasonable care is imposed upon the railroads by reason of such knowledge, their efficiency as public agencies will be seriously impaired."—Risbridger v. Michigan Central (Mich.), 157 N. W., 279.

Liability for Defects In Rolling Stock

In a brakeman's action for injuries there was evidence that he attempted to board a moving train, and that a handhold came loose, permitting him to fall. The New York Court of Appeals holds that the company's negligence was a question of fact under New York Railroad law, section 64, providing that, if an employee shall receive injury by reason of any defect in . . . any car, train or locomotive, which could have been discovered by the corporation by reasonable and proper care, tests or inspection, it shall be deemed to have had knowledge thereof, and such defect, when proved, shall be prima facie evidence of negligence on its part. It held that this section, when applicable, should have a construction liberal and commensurate with its purpose. Under the section, proof of a defect in a car is not conclusive evidence against the company, but the presumption of negligence should be taken with all the other proof in the action.—Kent v. Erie (N. Y.), 111 N. E., 1,071.

Track Storage Charges

New York Public Service Commissions law, section 28, requires common carriers to file with the commission schedules of rates and regulations. Section 29 provides that no change shall be made in rates, except upon 30 days' notice or order of the commission. Section 33 prohibits transportation unless rates are filed. Section 34 prohibits transportation at rates lower than those in the schedules filed. Section 49 provides that on motion or complaint the commission shall determine whether rates are reasonable, and the carrier shall thereafter obey the orders of the commission with respect to the rates to be charged. Shippers complained of alleged overcharges for track storage, and the commission ordered their refund. The New York Appellate Division held that the order was not binding on the courts as a judgment; no power being granted the commission to make such an order.

Although the Interstate Commerce Commission ruled track charges for delay in unloading during inclement weather to be unjust discrimination, that ruling is not conclusive upon intrastate shipments, where it does not appear that there was actual discrmination in the charges exacted.—Murphy v. New York Central, 156 N. Y. Supp., 50.

Crossing Accident—Crossing Trains—Contributory Negligence

The Colorado Supreme Court holds that the fact that an automatic signal bell required by a city ordinance at a crossing in a city is out of order and that a train is exceeding the ordinance speed limit does not relieve a person, before attempting to cross, from taking ordinary precautions for his own safety, and his contributory negligence in going on the tracks without looking and listening for an approaching train will bar recovery for his death. A bicyclist attempted to cross four tracks, two of them main tracks, about the time when he knew a passenger train would be approaching. A train had just passed when he went on the first main track and this would temporarily hide from his view the approaching passenger train, which struck him as he attempted to cross the second main track. In an action for his death it was held that, on reaching the middle space between the main tracks, and before going on the second track, it was his duty to look to see that he could cross in safety. The duty of one using a crossing to look and listen is continuous until the crossing is completed, unless the railroad produces a condition of apparent safety. Judgment for the defendant was affirmed.—Headley v. Denver & Rio Grande (Colo.) 154 Pac. 731.

Expelling Passenger from Pullman Into Another Coach—Negligence of Trainman—Excessive Damages

A female passenger by mistake got into a Pullman coach for which she had no ticket, and, when requested by the porter to go into another coach, said she was somewhat old and could not walk well while the train was running. The porter, however, insisted, and as the passenger, who was corpulent and burdened with a bundle and a suitcase, was walking through the car while the train was running rapidly around a curve, she fell and bruised her arm. In an action for her injuries the Kentucky Court of Appeals applied the rule relating to the expulsion of

trespassers from trains, that the trainmen must use ordinary care to prevent bodily injuries, and must not make use of excessive force, as, when she was commanded to leave the coach and go into another, it was an expulsion of her from the coach. While it is true, the court said, that passengers will move about in a coach to visit their acquaintances, or for other purposes, and will go from one coach to another, and that such movements rarely result in injuries to any one, and that such actions on their part are not acts of negligence per se, yet it is probably a question of fact, under all the circumstances of each particular case, as to whether or not a passenger is negligent in standing or walking about in a car which is in motion, or in going from one coach to another while the train is in motion. Hence, while it is not negligence as a matter of law for a servant of a railroad to require a passenger, while a train is in motion, to remove from one coach into another, when such passenger has no right to remain in the coach in which he is, it is a question of fact, to be determined from all the circumstances of each case, as to whether or not such act was negligence on the part of the servant of the railroad. If the servant knew or should have known that from age, bodily infirmity, the motion of the train or other circumstance, that it would endanger the safety of the passenger to require such removal, it would be negligence to require it. It was held that the question of the porter's negligence was properly submitted to the jury. Judgment for the plaintiff was reversed, however, on the ground that the verdict of $1,200 was grossly excessive, and apparently the result of passion or prejudice, the extent of the injury being a temporary painful bruise on the arm between the elbow and the shoulder, and a few minor scratches; and there being no evidence which would warrant a recovery of punitive damages.—L. & N. v. Ashley (Ky.), 183 S. W., 921.

Running Past Meeting Point—Inference of Negligence

A railroad's rules made conductors and engineers responsible for the safety of trains, putting the duty on each of them to take every precaution for their protection; enjoined on the conductor the duty of enforcing rules applicable to all other employees on the train; made it his duty to take entire charge of all employees thereon, and instructed enginemen to obey the conductors' orders as to starting, stopping, etc. A bulletin notified all employees that, on approaching stations where a train was required to wait for an opposing train, the engineman would sound one short blast of the whistle, and that, if this signal were not given, trainmen should take whatever steps were necessary to prevent the train passing the meeting point. The rules also required the conductor to deliver a copy of the despatcher's orders to the engineer, who was required to read them back to the conductor, and required the conductor and engineer to show the order to the brakeman and fireman. An engineer was killed by running past a point where he was ordered to meet another train and colliding with that train. The conductor, fireman, and front brakeman were riding on the engine, and they were also killed in the collision. In an action for the engineer's death, there was therefore no testimony as to what was said or done on the engine prior to or at the time of the accident. Copies of the train order were found in the pockets of the conductor and engineer. The plaintiff contended that the accident was, in whole or in part, the result of the negligence of the other employees, and the trial court submitted the question of their negligence to the jury. On appeal from a judgment for the plaintiff, the Circuit Court of Appeals, Fourth Circuit, held this to be error, as no inference of negligence on the part of the trainmen other than the engineer could be drawn from the facts. It could not be reasonably inferred that they approved of or assented to his action in running past the meeting point; it would be more reasonable to infer that they protested against such an action, for the purpose of saving their own lives.

The federal employers' liability act makes interstate carriers liable for injuries "resulting in whole or in part from the negligence of any of the officers, agents, or employees of such carrier," and provides that "the damages shall be diminished by the jury in proportion to the amount of negligence attributable to such employee"; but, while these provisions are intended to abolish the fellow servant doctrine, they are not intended to afford relief where one's injury is due solely to his own reckless and indifferent conduct.—Virginian Ry. Co. v. Linkous, C. C. A., 230 Fed. 88.

Railway Officers

Executive, Financial, Legal and Accounting

J. A. Brown has been elected president of the Trona Railway, with office at 366 Pacific Electric building, Los Angeles, Cal., vice A. de Ropp.

C. E. Wright, auditor of the Copper Range Railroad at Houghton, Mich., has been appointed auditor and car accountant, with office at Houghton.

George S. Humphrey has been appointed assistant chief claim agent of the Grand Trunk, with office at Detroit, Mich., succeeding W. V. Butler, resigned to accept service elsewhere.

Richard H. Aishton, vice-president of the Chicago & North Western, at Chicago, has been elected president and a director, succeeding William A. Gardner, deceased, and Marvin Hughitt, Jr., general traffic manager at Chicago, has been appointed vice-president in charge of operation and maintenance.

James T. Clark, vice-president of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, Minn., has been elected president, succeeding William A. Gardner, deceased. A. W. Trenholm, general manager at St. Paul, has been appointed vice-president and general manager, and Charles Jensch has been appointed controller.

Henry McAllister, Jr., recently appointed general counsel of the Denver & Rio Grande, with office at Denver, Colo., was born at Philadelphia, Pa., on February 28, 1872. He was educated in the public and high schools of Colorado Springs, Colo., and graduated from Swarthmore College in 1892. He studied law at Colorado Springs, and was admitted to the bar in 1894. He was assistant district attorney of the fourth Colorado judicial district from 1895 to 1898, and district attorney from 1898 to 1901. He engaged in the private practice of law in Colorado Springs from 1894 to 1906, when he removed to Denver, where he has practiced up to the present time. From January 1, 1908, to May 1, 1916, he has been a member of the firm of Vaile, McAllister & Vaile, the senior member of which was the late Joel F. Vaile, who was general counsel of the Denver & Rio Grande at the time of his death. In November, 1915, Mr. McAllister was appointed assistant general counsel of the Denver & Rio Grande, and on May 4, 1916, was promoted to general counsel to succeed Mr. Vaile, who died on April 3.

H. McAllister, Jr.

Charles R. Moore, whose appointment as assistant to vice-president of the Grand Trunk with headquarters at Montreal, Que., has already been announced in these columns, was born on October 12, 1867, at Hamilton, Ont., and was educated in the public schools, also at Collegiate Institute, and at Canada Business College. He began railway work in 1883, on the Grand Trunk as a junior clerk at Hamilton, Ont., in the mechanical accountant's office, and subsequently served successively in the motive power, car, maintenance of way and transportation departments at various places on the same system. In 1911, while he was chief clerk to the superintendent at Toronto, he was promoted to chief clerk to the vice-president in charge of operation, from which position he is now promoted to assistant to vice-president in charge of operation of the same road, as above noted.

Operating

A. J. Klamt has been appointed superintendent of the Trona Railway with headquarters at Trona, Cal., vice C. H. Beatty, resigned.

John M. Condon, yardmaster of the Erie at Marion, Ohio, has been appointed assistant to the general superintendent, with headquarters at Youngstown, Ohio.

G. A. Harwood, chief engineer of electric zone improvements of the New York Central at New York, has been appointed engineering assistant to the vice-president in charge of operation, with duties assigned, and headquarters at New York.

Beginning June 1, 1916, the management of the Wellsville & Buffalo will be separate from the Buffalo & Susquehanna. F. E. Dewey has been appointed general manager of the Wellsville & Buffalo in charge of traffic, transportation and maintenance, with headquarters at Buffalo, N. Y.

L. C. Spengler has been appointed general agent of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, with office at Newport News, Va., vice J. H. Graves, resigned. W. S. Upshur, in addition to duties already assigned, has been appointed acting grain elevator manager, with office at Newport News.

Charles Ware, general manager of the Union Pacific, has resigned, effective at the convenience of the president. He was born at Jonesboro, Ill., on January 31, 1863, and was educated at the Southern Illinois Normal University at Carbondale, Ill. He entered railway service in 1882, as a telegraph operator of the Chicago & North Western. He was subsequently promoted to despatcher and chief despatcher, and in 1890, entered the employ of the Union Pacific. Until April, 1905, he was consecutively despatcher, chief despatcher, and assistant superintendent; from April, 1905, to March 9, 1910, he was superintendent of the Nebraska division of the same railroad. After serving as general superintendent until May, 1910, he was appointed assistant general manager, which position he held until September 1, 1912, when he was promoted to general manager.

C. Ware

J. W. Deneen, trainmaster of the Baltimore & Ohio at Cumberland, Md., has been appointed assistant superintendent, with headquarters at Cumberland, Md., vice J. K. Yohe, resigned. E. C. Groves has been appointed trainmaster of the east end of the Cumberland division, with headquarters at Cumberland, vice Mr. Deneen.

Division headquarters of the Spokane, Portland & Seattle have been restored at Vancouver, Wash., with R. C. Wegner, division superintendent; F. C. Wager, master mechanic; M. C. Labertew, trainmaster; R. E. White, chief despatcher. G. E. Votaw remains in charge of the Portland division of this road and of the Oregon Electric and the United Railways, with headquarters at Portland.

A. S. Ingalls, general superintendent of the Third district of the New York Central Lines West, has been appointed assistant general manager. Frank M. Smith, superintendent of the Western division at Chicago, has been appointed general superintendent, vice Mr. Ingalls, with office at Cleveland, Ohio. E. R. Bissell, superintendent at Detroit, Mich., succeeds Mr. Smith at Chicago. F. F. Riefel, superintendent of telegraph at Cleveland, succeeds Mr. Bissell at Detroit.

John Franklin Clark, traveling car service agent of the Northern Pacific, has been appointed trainmaster of the Rocky Mountain division, with office at Helena, Mont. D. A. McMillan, assistant general air brake inspector, has been appointed trainmaster of the Montana division, with office at Logan, Mont., vice H. D. Mudgett, transferred. Fred. Brastrup, trainmaster at Livingston, has been transferred in the same capacity to Seattle, Wash., vice O. F. Ohlson, transferred.

R. E. Landis, trainmaster of the Great Northern at Breckenridge, Minn., has been appointed superintendent of the Marcus division, with headquarters at Marcus, Wash. F. D. Kelsey, division superintendent at Spokane, Wash., has been appointed superintendent of the Minot division, with headquarters at Minot, N. Dak., vice R. L. Knebel, assigned to other duties. F. J. Gavin, trainmaster at Spokane, Wash., has been appointed superintendent of the Spokane division, with headquarters at Spokane, vice F. D. Kelsey, transferred.

T. W. Evans, general superintendent of the Second district of the New York Central at Buffalo, N. Y., has been appointed assistant general manager of the lines east of Buffalo, with headquarters at New York. C. Christie, superintendent of the Hudson division at New York, has been appointed general superintendent of the Second district, with headquarters at Buffalo. F. E. Williamson, superintendent of the St. Lawrence division at Watertown, N. Y., succeeds Mr. Christie. D. L. Sommerville, superintendent of the Adirondack division at Utica, N. Y., succeeds Mr. Williamson. T. W. Crowley, assistant superintendent at New York, has been appointed superintendent of the Adirondack division, with office at Utica, succeeding Mr. Sommerville; and F. N. Melius, trainmaster at Poughkeepsie, has been appointed assistant superintendent of the Hudson division, with office at New York, succeeding Mr. Crowley.

Cornelius Christie, who has been appointed general superintendent of the Second district of the New York Central with headquarters at Buffalo, N. Y., was born on September 24, 1864. He began railway work in July, 1881, as a telegraph operator on the New York, Susquehanna & Western, remaining in that position until June 4, 1883. He then served as telegraph operator on the West Shore Railroad until April, 1888, and then was appointed trainmaster on the same road. Seven years later he became trainmaster on the River division of the New York Central & Hudson River; in September, 1902, he was appointed division superintendent of the same road, and now becomes general superintendent of the Second district of the New York Central with headquarters at Buffalo, as above noted. At the time of his recent appointment, Mr. Christie was superintendent of the Hudson division with office at New York.

C. Christie

J. B. Crawford, car service agent of the Pacific Fruit Express, has been appointed superintendent of transportation, with office at Chicago, Ill., and has assumed the duties heretofore handled by the car service agent and the general agent, which offices have been abolished. Mr. Crawford was born at Franklin Grove, Ill., on December 21, 1882, and entered the service of the Pacific Fruit Express in September, 1907, in a clerical capacity. He was subsequently promoted to chief clerk to the general agent, and chief clerk to the car service agent, and on June 1, 1915, was promoted to car service agent. His appointment as superintendent of transportation was effective on May 15.

Traffic

John J. Osborn has been appointed assistant foreign freight agent of the Union Pacific System, with office at Chicago.

B. M. Flippin has been appointed assistant to general traffic manager of the Texas & Pacific, with office at New Orleans, La.

E. T. Stebbing has been appointed general agent of the Canadian Pacific Ocean Services Limited, with headquarters at New York.

Golder Shumate has been appointed division freight agent of the Baltimore & Ohio at Youngstown, Ohio, vice E. M. Davis, promoted.

H. C. Fisher, traveling freight agent of the Lake Erie & Western at Indianapolis, Ind., has been appointed general agent, with headquarters at New York City, succeeding D. J. Bill, transferred.

H. M. Pearce, freight traffic manager of the Chicago, St. Paul, Minneapolis & Omaha, at St. Paul, Minn., has been appointed general traffic manager. (See Executive, Financial, Legal & Accounting.)

A. C. Johnson, passenger traffic manager of the Chicago & North Western, at Chicago, has been appointed general traffic manager, succeeding Marvin Hughitt, Jr. (See Executive, Financial, Legal & Accounting.)

Theodore Dehon has been appointed general southern agent of the Carolina, Clinchfield & Ohio of South Carolina, with headquarters at Spartanburg, S. C. The office of division freight and passenger agent has been abolished.

C. A. Smith, assistant general freight agent of the Carolina, Clinchfield & Ohio, at Johnson City, Tenn., has been appointed general freight agent; A. W. Sanders, and A. I. Hays, have been appointed assistant general freight agents.

J. Howard Magee, traveling freight agent of the Western Maryland at Baltimore, Md., has been appointed division freight agent, with office at Cumberland, Md., succeeding H. E. Williams, who has resigned to go into other business at Buffalo, N. Y.

G. C. Kelleher, assistant general passenger agent of the New Orleans & Northeastern, the Alabama & Vicksburg, and the Vicksburg, Shreveport & Pacific at New Orleans, La., has been appointed general passenger agent, vice George H. Smith, deceased.

Alfred J. Ball, eastern superintendent of the Empire line at Philadelphia, Pa., has been appointed foreign freight agent of the Pennsylvania Railroad of the lines east of Pittsburgh and Erie, with office at Philadelphia, succeeding Warner R. Howell, deceased. Frederick L. Baker, agent of the Empire line at Cleveland, Ohio, succeeds Mr. Ball.

J. H. Mulchay, assistant general freight agent of the Southern Pacific Company at Portland, Ore., has been appointed assistant general freight agent, with headquarters at San Francisco, Cal. J. T. Saunders has been appointed assistant general freight agent, with headquarters at San Francisco. W. F. Miller has been appointed assistant general freight agent with headquarters at Portland, Ore., and M. A. Cummings has been appointed industrial agent with headquarters at Los Angeles, Cal.

B. L. Hamner has been appointed general development agent of the Seaboard Air Line in charge of the industrial department. J. A. Pride, general industrial agent at Norfolk, Va., has resigned, and the position of general industrial agent has been abolished. S. T. Anderson has been appointed assistant general development agent. T. S. Evans has been appointed agricultural agent, with office at Hamlet, N. C. The title of each assistant industrial agent has been changed to assistant development agent.

Frank Bowman, eastern passenger agent of the Chicago & Alton at New York City, has been promoted to general agent, pasenger department, New York City, in charge of passenger traffic in the New England and New York territories, reporting to the general eastern agent. Fred L. Chase, division passenger agent at Springfield, Ill., has been appointed southeastern passenger agent, with headquarters at Atlanta, Ga. C. R. Murray, western passenger agent at Kansas City, Mo., has been appointed district passenger agent, with office at Detroit, Mich. M. W. Dancy has been appointed division passenger agent at Springfield, Ill., vice Mr. Chase, transferred; effective May 15.

Allen Wightman Sanders, who has been appointed assistant general freight agent of the Carolina, Clinchfield & Ohio with office at Johnson City, Tenn., was born on April 14, 1888, at Savannah, Ga., and was educated in the grammar schools. He began railway work on May 28, 1902, with the Central of Georgia and remained with that road filling various clerical positions in the rate department, until December 10, 1911, except for four months in the winter of 1908, during which time he was with the Virginia Lines Tariff Bureau. On December 10, 1911, he went to the Carolina, Clinchfield & Ohio as chief rate clerk; the following November he was appointed chief clerk, and now becomes assistant general freight agent of the same road as above noted.

Charles Theodore Mandel, whose appointment as general passenger agent of the Carolina, Clinchfield & Ohio, with office at Johnson City, Tenn., has already been announced in these columns, was born on June 28, 1865, at Steubenville, Ohio, and was educated in the public schools of his native town. He began railway work in November, 1879, with the Pittsburgh, Cincinnati & St. Louis, now part of the Pittsburgh, Cincinnati, Chicago & St. Louis; and served consecutively to October, 1886, with the mechanical, maintenance of way, passenger and freight departments of that road. From October, 1886, to December, 1894, he served as passenger rate and division clerk for the Western Passenger Association and on a number of different roads. He was then passenger, rate and division clerk in the ticket auditor's office of the Chicago & North Western at Chicago. He served as chief clerk to the assistant general passenger agent of the Erie from February, 1895, to August, 1898, and then to February of the following year was special passenger rate and division clerk in the office of the general passenger agent of the Southern Railway at Washington, D. C. He then served as traffic clerk in the quartermaster's department of the United States Army until September, 1902, when he was appointed secretary of the Chicago Local Passenger Bureau at Chicago, and from November, 1905, to the following May was in the passenger department of the Chicago, Rock Island & Pacific, at Chicago. From May to November, 1906, he was secretary of the New Orleans Passenger Bureau, and then for one year was secretary of the Southern Car Service Association at New Orleans, La. He was engaged on special tariff work in the general passenger department of the Louisville & Nashville from February, 1908, to January, 1909, when he entered the service of the Carolina, Clinchfield & Ohio as traveling passenger agent. In November, 1912, he was promoted to assistant general passenger agent, which position he held at the time of his recent appointment as general passenger agent of the same road, as above noted.

C. T. Mandel

Engineering and Rolling Stock

M. G. Charles, master mechanic of the Oregon Electric and the United Railways at Portland, Ore., has had his jurisdiction extended over the Portland division of the Spokane, Portland & Seattle.

C. D. Cronk, assistant engineer, signal department of the New York Central, Lines East, at Albany, N. Y., has been appointed assistant signal engineer, New York Central, Lines West, with headquarters at Cleveland, Ohio.

F. H. Nicholson, signal inspector of the New York, New Haven & Hartford, at New Haven, Conn., has been appointed assistant signal engineer, in charge of speed control and automatic stop investigations, with office at New Haven.

W. J. Renix, district master mechanic of the Canadian Pacific at Revelstoke, B. C., has been appointed master mechanic of

the Saskatchewan division, with headquarters at Moose Jaw, Sask. A. Brown, district master mechanic at Winnipeg, Man., has been appointed master mechanic at Revelstoke, vice W. J. Renix, transferred. G. Twist, locomotive fireman at Ft. William, Ont., has been appointed district master mechanic at Winnipeg, vice A. Brown, transferred.

H. C. Cosand, division engineer of the Chicago, Rock Island & Pacific at Eldon Mo., has assumed in addition the duties of master carpenter, succeeding B. H. McNamara, transferred. Effective May 21.

H. D. Cameron, whose appointment as mechanical engineer of the Canadian Northern, with office at Toronto, Ont., has already been announced in these columns, was born on September 23, 1879, at Toronto, and was educated in Montreal public and high schools, and in 1901 graduated from McGill University with the degree of B. S. He began railway work in the summer of 1899, as a mechanical apprentice at the Grand Trunk shops, Montreal, Que., and continued in shop work during vacations and after graduation until 1902. He subsequently worked for about one year in the mechanical department drawing office at Ottawa, Ont., of the Canada Atlantic, now a part of the Grand Trunk. From 1903 to 1905 he was assistant engineer of the Montreal Water & Power Company, and then joined the engineering staff of the Gulf, Colorado & Santa Fe at Cleburne, Tex. In 1906 he returned to Canada and entered the service of the Canadian Northern in the mechanical department at Winnipeg, and in April, 1916, was transferred to Toronto as mechanical engineer of the same road, as above noted.

OBITUARY

T. S. Mahoney, division superintendent of the Texas & Pacific with office at Fort Worth, Texas, died at Texarkana, Ark., on May 20.

Cyrus W. Fisher, formerly general manager of the Chicago, Kansas & Nebraska, now a part of the Rock Island Lines, died at his home at Bucyrus, Ohio, on May 17, at the age of 80. Mr. Fisher entered the railway service in 1852, and during his career served as superintendent of the Denver division of the Kansas Pacific, superintendent of the Mountain division of the Union Pacific, general manager of the Denver, South Park & Pacific, president and general manager of the Denver & New Orleans, and general manager of the Chicago, Kansas & Nebraska.

Michael F. Molloy, controller of the Cincinnati, New Orleans & Texas Pacific and the Alabama Great Southern, and auditor of the Harriman & Northeastern, with headquarters at Cincinnati, Ohio, died in that city on April 22, as previously noted. Mr. Molloy was born on September 16, 1859, at Cincinnati, and was educated in the public schools of that city and at Nelson Business College. He entered railway service on April 1, 1880, as junior ticket clerk in the service of the Cincinnati, New Orleans & Texas Pacific. He was continuously in the service of that road up to the time of his death, holding the following positions successively: freight settlement clerk and chief clerk freight department until 1884; 1884 to 1892, traveling auditor; 1892 to 1895, chief bookkeeper; 1895 to May, 1899, chief clerk and assistant auditor; May, 1899, to January, 1900, acting auditor; January, 1900, to December 15, 1906, auditor; December 15, 1906, up to the time of his death, controller of the Cincinnati, New Orleans & Texas Pacific and of the Alabama Great Southern, and auditor of the Harriman & Northeastern.

M. F. Molloy

Equipment and Supplies

LOCOMOTIVES

THE CUPEY SUGAR COMPANY is inquiring for one Mogul type locomotive.

THE NEW YORK CENTRAL has issued inquiries for 25 Mallet type locomotives.

JOSE GOENAGA is inquiring for prices on one ten-wheel and one Consolidation locomotive.

THE PENNSYLVANIA LINES WEST are reported in the market for 75 Mikado locomotives.

FAIRBANKS, MORSE & CO., Chicago, are in the market for one six-wheel switching locomotive.

THE PENINSULAR RAILWAY has ordered one Mikado locomotive from the Baldwin Locomotive Works.

THE SOUTH AFRICAN GOVERNMENT RAILWAYS are inquiring for prices on several Pacific and Mountain type locomotives.

THE INTERMOUNTAIN RAILWAY has ordered 2 70-ton Shay geared locomotives from the Lima Locomotive Corporation.

THE UNITED STEEL COMPANY, Canton, Ohio, recently ordered 2 saddle-tank locomotives from the Lima Locomotive Corporation.

THE PARIS-LYONS-MEDITERRANEAN RAILWAY of France has ordered 20 Mikado locomotives from the Baldwin Locomotive Works.

THE CANADIAN GOVERNMENT RAILWAYS have ordered one 12-ft cut rotary snow plow from the American Locomotive Company.

THE CHERRY RIVER BOOM & LUMBER COMPANY has ordered one 90-ton Shay geared locomotive from the Lima Locomotive Corporation.

THE PHOENIX LOGGING COMPANY, Spokane, Wash., has ordered one Shay geared locomotive from the Lima Locomotive Corporation.

THE STANDARD CAR CONSTRUCTION COMPANY, Sharon, Pa., has ordered one four-wheel switching locomotive from the Baldwin Locomotive Works.

THE SOUTHERN RAILWAY has ordered 14 locomotives from the Lima Locomotive Corporation and is said to be about to place an order for 20 more locomotives.

MINNESOTA, DAKOTA & WESTERN.—The item in the *Railway Age Gazette* of May 5, to the effect that this company is in the market for a locomotive, has been denied.

THE SEABOARD AIR LINE, reported in the *Railway Age Gazette* of April 28 as inquiring for 10 Mountain type locomotives, has ordered 5 locomotives of this type from the American Locomotive Company.

THE CALUMET, HAMMOND & SOUTHEASTERN has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works in addition to the locomotive reported in the *Railway Age Gazette* of May 5.

RUSSIAN GOVERNMENT.—Aemilius Jarvis, president of the Canadian Locomotive Company, recently announced that a request had been received by cable to quote prices on a new order for 600 locomotives for the Russian Government.

THE ANN ARBOR, reported in the *Railway Age Gazette* of March 24 as being in the market for 3 or 4 Mikado locomotives, has ordered 3 superheater Mikado locomotives from the American Locomotive Company. These locomotives will have 27 by 30-in. cylinders, 63-in. driving wheels, and a total weight in working order of 290,000 lb.

THE DENVER & RIO GRANDE, reported in the *Railway Age Gazette* of April 28 as inquiring for 10 Santa Fe type locomotives, has ordered these engines from the American Locomotive Company. The locomotives will have 31 by 32-in. cylinders,

63-in. driving wheels, a total weight in working order of 420,000 lb., and will be equipped with superheaters.

THE TEMISKAMING & NORTHERN ONTARIO was reported in last week's issue as having ordered 6 Mikado locomotives from the Canadian Locomotive Company. These locomotives will have 25 by 30-in. cylinders, 63-in. driving wheels, a total weight on driving wheels of 188,000 lb., and a total weight of 246,000 lb. The engines will be equipped with superheaters.

THE CANADIAN GOVERNMENT RAILWAYS were reported in last week's issue as having ordered 30 Mikado locomotives from the Canadian Locomotive Company for the Intercolonial Railway. These locomotives will have 27 by 30-in. cylinders, 63-in. driving wheels, a weight on driving wheels of 213,500 lb., a total weight of 283,000 lb., and will be equipped with superheaters.

FREIGHT CARS

THE BATESVILLE SOUTHWESTERN is inquiring for 10 flat cars.

THE NEW YORK CENTRAL LINES are reported in the market for 600 underframes.

THE ILLINOIS TRACTION COMPANY is reported in the market for 100 box, 50 hopper and 50 coal cars.

THE ILLINOIS CENTRAL has postponed its purchases of stock cars because of the high prices.

PASSENGER CARS

THE SOUTHERN RAILWAY has ordered 3 dining cars from the Pullman Company.

THE NORFOLK & WESTERN was reported in last week's issue as having ordered 20 passenger train cars from the Harlan & Hollingsworth Corporation. This order was divided as follows: 7 coaches, 6 baggage and express cars, 4 baggage and mail cars, and 3 postal cars.

IRON AND STEEL

THE LEHIGH VALLEY has ordered 1,600 tons of bridge work from the Phoenix Bridge Company.

THE CHICAGO UNION STATION COMPANY has ordered 148 tons of I-beams from the Scully Steel & Iron Company.

THE MILWAUKEE LIGHT, HEAT & TRACTION COMPANY has placed orders for 116 tons of steel for a new boiler room at Racine, Wis.

THE NEW YORK CENTRAL has ordered 300 tons of steel from Terry & Tench for a viaduct on Vanderbilt avenue, New York, between 48th and 49th streets.

THE PENNSYLVANIA RAILROAD has ordered 2,600 tons of bridge work from the Fort Pitt Bridge Works, and 1,800 tons from the Phoenix Bridge Company.

THE NEW YORK PUBLIC SERVICE COMMISSION, first district, will receive bids on Monday, June 5, at 11.30 a. m., for the supply of about 90,000 tons of structural steel for use in the construction of several portions of the dual system rapid transit lines.

TRACK SPECIALTIES

THE CHICAGO GREAT WESTERN has placed orders for 19,000 combined rail anchors and tie plates for the eastern division, and 11,000 for the northern division.

MISCELLANEOUS

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a second-hand 60 to 70-ft. turntable.

THE LOUISVILLE & NASHVILLE has awarded contracts to the Roberts & Schaefer Company, Chicago, for the coal and sand handling equipment for three 400-ton capacity reinforced concrete, automatic electric, standard counterbalanced bucket locomotive coaling plants, and three "Rand S" gravity sand plants using the Beamer patent steam sand dryer, which the railway will build at Hazard, Ravenna and De Coursey, Ky.

Supply Trade News

Cloud C. Conkling, chief civil engineer of the Lackawanna Steel Company, died May 8, aged 53 years.

James T. Hall, president of the National Surface Guard Company, Chicago, died in that city on May 18, age 81.

The Acme Supply Company has removed its general sales offices to larger quarters located at 1110-1113 Steger building, Chicago.

The Westinghouse Lamp Company will move its executive offices to the City Investing building, 165 Broadway, New York, on June 1.

The Pullman Company has set aside 5,000 shares of stock for which officers and employers are allowed to subscribe in various allotments.

The Cement-Gun Construction Company, Chicago, has moved its offices to more commodious quarters in the Karpen building, 900 South Michigan avenue.

Edward C. Harrison, for 14 years chief engineer at the Granite City plant of the Commonwealth Steel Company, St. Louis, died of apoplexy May 11, aged 56 years.

The American Steel Foundries is adding a 50-ft. extension to one end of its Alliance, Ohio, plant, and is also extending 150 ft. at the other end. This will make a total of about 10,000 sq. ft. of additional space.

At the recent annual meeting of the Norma Company of America in New York, W. M. Nones, secretary-treasurer and general manager of the company, was elected president and treasurer. In his new position, Mr. Nones will continue to perform the duties of general manager.

Henry C. Hammack has been elected secretary and treasurer of the Lima Locomotive Corporation, Lima, Ohio, to succeed John H. Guess, who recently resigned. Mr. Hammack has been with the company for eighteen years, having served as general and field manager and assistant secretary.

F. L. Fay, formerly general manager of the Greenville Steel Car Company, has been elected president and now has the controlling interest in the business. James G. Dimmick is vice-president and will have charge of the production department and factory management. The company is enlarging its plant to handle more business.

Henry M. Cleaver, for some years advertising manager of the Niles-Bement-Pond Company, New York, is now located at the Pond works of the company, Plainfield, N. J., to the affairs of which he will devote himself exclusively in the future. The advertising department is in charge of D. M. Crossman, heretofore assistant advertising manager.

The American Locomotive Company has received an order for 2,200,000 three-inch fuses having a total value of $9,000,000. The Westinghouse Air Brake Company will manufacture one-half the order and the Nathan Manufacturing Company, New York, will make some of the parts for the American Locomotive Company's part of the order.

The Modern Tool Company, Erie, Pa., will hereafter devote its attention to its line of self-contained internal plain and universal grinding machines. It has sold its overhead countershaft line of plain, internal and universal grinders to Albert J. Ott, Chicago, Ill., who will manufacture and market these machines under the name of the Ott grinders.

The Southwark Foundry & Machine Company, manufacturing internal combustion engines, turbines, pumps, hydraulic presses, blowers and other machines, has been acquired by the Baldwin Locomotive Works, and will be operated without change in organization. The Southwark Company was purchased by Alba B. Johnson and Samuel M. Vauclain, president and vice-president respectively of the Baldwin Locomotive Works, about four years ago. The capitalization of the Southwark Company is

$650,000 preferred stock, $650,000 common stock and $600,000 five per cent bonds.

Samuel M. Vauclain, vice-president of the Baldwin Locomotive Works, has been elected a director of the Westinghouse Electric & Manufacturing Company, succeeding C. F. Brooker, resigned. Mr. Vauclain is also a director of the Standard Steel Works Company, the Midvale Steel & Ordnance Company, the Bucyrus Company, and the Southwark Foundry & Machine Company.

David Lupton's Sons Company, Philadelphia, Pa., manufacturers of special construction for light and ventilation in fireproof buildings, has opened a direct sales office at 1150 Oliver building, 141 Milk street, Boston, Mass., in charge of Harry Wolf as sales engineeer. H. R. Wilkinson, the company's New York manager, now has general supervision of New England sales, and the direct Lupton service is extended through New England.

Among the contracts recently awarded the Raymond Concrete Tile Company of New York and Chicago are the following: Concrete piling for the Coney Island Terminal of the New York Municipal Railways Corporation; concrete piling for the foundation of a bridge over Queens Boulevard, Long Island City, for the New York Connecting, and concrete piling for the foundation of a yardman's building, Jersey City, N. Y., for the Pennsylvania Railroad.

James T. Hall, president of the National Surface Guard Company, Chicago, died at that city on May 18, aged 81. Mr. Hall was born at Newport, Herkimer county, N. Y., in February, 1835. As a young man, he engaged in the lumber business at St. Louis, Mich., and Alma. Later he was superintendent of the Chicago, Saginaw & Canada, now a part of the Pere Marquette. When the Toledo, Ann Arbor & Northern was being built from St. Louis, Mich., north, for a distance of about 40 miles, he was in charge of the construction work. Twenty-seven years ago he went to Chicago, where he invented the first steel cattle guard and organized the National Surface Guard Company, of which he was president from that date up to the time of his death in Chicago on May 18.

J. T. Hall

The City of Houston, Texas, has adopted the Cleveland Dock Engineering Company's design for a marginal dock in Buffalo Bayou, Houston. The dock, which is 777 ft. long and about 45 ft. wide, consists essentially of a reinforced concrete beam and girder floor, supported over the water on piles, with a buttress wall on the outer margin to retain the fill. It is to be used for general freight handling purposes, and will cost about $325,000, with equipment.

J. M. FitzGerald, general manager of the signal department of the Railroad Supply Company, Chicago, severed his connection with that company, effective May 17, and has organized the Alger Supply Company, with offices at room 550 Peoples Gas building, Chicago. Associated with Mr. FitzGerald is O. S. Flath, who has resigned his position with the Gordon Battery Company. The new company will handle a number of accounts, including the Schwarze products of the Electrical Sales Company, and the kerosene torches manufactured by the Chausse Manufacturing Company, and will also represent the Signal Accessories Co., and C. H. Whall & Co.

At the annual meeting of the directors of Fairbanks, Morse & Co., Chicago, held on May 17, C. H. Morse, Sr., was elected chairman of the board, and C. H. Morse, Jr., was re-elected president. The following have been elected directors of the E. & T. Fairbanks & Co., St. Johnsbury, Vt., recently acquired by Fairbanks, Morse & Co.; C. H. Morse, Jr., W. E. Miller and W. S. Hovey, of Chicago; Thomas McMillan, of Montreal, and H. J. Fuller, of New York, succeeding Henry C. Ide and Charles A. B. Pratt, of New York, and Joseph Fairbanks, A. H. McLeod and C. L. Harpham, of St. Johnsbury, Vt. Officers were elected as follows: Frank H. Brooks, president; C. H. Morse, Jr., vice-president; John C. Clark, secretary, and Fred C. Beck, treasurer.

C. J. Wymer, general car foreman of the Belt Railway of Chicago, has resigned that position to enter the employ of the Grip Nut Company as sales agent. Mr. Wymer was born in Jane Lew, W. Va., and after leaving school served his apprenticeship with the West Virginia & Pittsburgh, now a part of the Baltimore & Ohio system. He entered the employ of the mechanical department of the Atchison, Topeka & Santa Fe at Raton, N. M., in September, 1896. He was promoted to car foreman at Trinidad, Colo., in 1898, where he remained until 1907, when he was appointed general car foreman of the Chicago & Eastern Illinois at Danville, Ill. In 1908 he came to Chicago, Ill., to become general car foreman of the Belt.

Joseph E. Brown has been appointed eastern sales manager of the O'Malley-Beare Valve Company, with headquarters at New York City, and E. A. Woodworth has been appointed western sales manager, with headquarters at 845 Railway Exchange building, Chicago. Mr. Brown has been in the employ of the Standard Paint Company for over six years, at first being connected with the New York office of that company, and since 1914 stationed at Chicago as western railroad representative in charge of railroad, government and packinghouse business. Previous to his advent into the railroad supply business he was connected with the purchasing department of the Erie in New York City. In his new position he will have charge of the railroad and industrial business in eastern territory. Mr. Woodworth was formerly with the Chicago, Rock Island & Pacific and the Illinois Central, and held various positions in the mechanical departments of those roads.

Ward B. Perley, assistant to the president of the United States Steel Corporation since May, 1911, has been elected vice-president and general manager of the Canadian Steel Corporation, and has been succeeded by John Hughes, for the past 13 years general agent of the United States Steel Products Company. The Canadian Steel Corporation is a subsidiary of the United States Steel Corporation, which has been organized to build the new Canadian works at Ojibway, Ont. The first announcement that the steel corporation would build a Canadian works was made several years ago, but the announcement of the organization of the new corporation indicates that active work of construction on the new works will probably be begun in the near future. Mr. Perley has had a long experience with blast furnace practice and the manufacture of pig iron. He began work with the Franklin furnace of the Franklin Iron Works Company at Columbus, Ohio, and when this plant was purchased by King, Gilbert & Warner remained with the latter company for 11 or 12 years. He was later associated with the Cherry Valley Iron Works at Leetonia, Ohio, and participated in its management. When the National Steel Company was formed in 1899, he was made assistant to the vice-president in charge of the operating department. In 1901 he became connected with the New York offices of the steel corporation. Previous to 1911 he was assistant to the vice-president, and since 1911 as assistant to the president he has had charge of the distribution of raw materials other than iron, ore and coke.

"Railroad Preparedness Day" at Wilmerding

June 5 will be "Railroad Preparedness Day" at the Westinghouse Air Brake Company's ammunition plant at Wilmerding, Pa.

On the ground that railroad shops with their heavy machinery and skilled mechanics would probably be among the first to be called upon to turn out ammunition on an outbreak of hostilities, the company has extended an invitation to railway mechanical officers to visit the plant and to see how the company is successfully turning out 10,000 complete shells a day. The plant will be thrown open for their inspection and they will be given an opportunity to witness every operation involved in the production of an

18 lb. or 3 in. shrapnel shell complete, including brass cartridge case, steel shrapnel shell loaded with 327 ⅜ in. bullets and time fuse.

The Air Brake Company is now working on the contract which it received from the British government in 1915 for 1,250,000 shells. In order to execute this contract without interfering with the company's standard line of manufacture, it was necessary to erect new buildings, purchase special machinery and material in large volume, involving an initial outlay of several million dollars, besides providing a separate organization, and conducting experiments as to manufacturing methods and processes, as experts in this line of manufacture were not obtainable. The company, having successfully solved the many difficult problems peculiar to ammunition manufacture, is now turning out 10,000 complete shells per day, and stands ready to offer the railway men the benefit of its experiences.

Westinghouse Electric & Manufacturing Company

The annual report of the Westinghouse Electric & Manufacturing Company for the fiscal year ended March 31, 1916, shows that the sales billed and the net income for the year were in excess of those in any previous year in the history of the company. The gross earnings totaled $50,269,240 as compared with $33,671,485 in 1915 and $43,733,646 in 1914. The net manufacturing profits for 1916, after the deduction of cost of sales and cost of manufacture, including depreciation of property and plant and all selling, administration and general expenses, were $9,429,896 as compared with only $2,562,000 in 1915. The company's net income for the year was $9,666,789 as against $2,900,744 in 1915 and $4,058,809 in 1914. The surplus at the close of the fiscal year was $9,246,707 as compared with $7,473,412 on March 31, 1915.

The splendid showing evidenced in the report was largely due to orders for war munitions, the shipments on account of which amounted to $8,578,266. The company is obtaining a share of domestic prosperity, however, for the value of orders received during the year exclusive of orders for war munitions was $58,218,171, and the value of unfilled orders as of March 31, 1916, for the regular products of the company was $22,097,995 as compared with $5,464,000 (of which $3,486,445 was for war munitions) at the same date in 1915. The amount of war munition work that is being done in the main works at East Pittsburgh is small and has not materially interfered with the output of the regular products of the company. The total orders for war munitions booked by the company, its proprietary companies and the Westinghouse Machine Company amount to approximately $96,527,000. A large part of this is included in the contracts for the manufacture of 1,800,000 army rifles which are now being manufactured by the recently incorporated New England Westinghouse Company at its factories in Springfield, Chicopee Falls and East Springfield, Mass. No shipments have yet been made on this contract, and no income has been received from this source. The advance cash payments, amounting to $12,037,500, received on account of the rifle contract, have been paid over to the New England company. This amount and the assets and liabilities of the New England company are not included in the parent company's balance sheet given herewith in brief:

Assets	
Property and plant	$21,201,305
Sinking fund	706
Investments	15,662,752
Current assets, including $7,797,676 cash	21,864,587
Working and trading assets	18,850,947
Other assets	4,852,649
Total	$82,432,946
Liabilities	
Preferred stock	$3,998,700
Common stock	52,644,800
Funded debt	3,283,000
Collateral and long term notes	2,816,250
Real estate purchase money mortgage	210,000
Current liabilities	9,470,826
Reserve	762,662
Profit and loss—Surplus	9,246,707
Total	$82,432,946

TRADE PUBLICATIONS

FENCE POSTS.—The National Concrete Machinery Company, Madison, Wis., has issued a 16-page illustrated pamphlet describing the use and manufacture of concrete fence posts for railroads.

Railway Construction

BALTIMORE & OHIO.—A contract has been given to H. S. Kerbaugh, Inc., New York, for building 4.5 miles of single track line from Hagerstown, Md., to Security. The work will be started at once, and will cost about $100,000.

BEAVER VALLEY.—Incorporated in Montana, with $500,000 capital, to build from Baker, Mont., on the Chicago, Milwaukee & St. Paul, south to Ekalaka, about 45 miles. The incorporators include W. H. Peck, George A. Baker, C. G. Rickard, Ekalaka, and F. F. Thomas, Baker.

LEAVENWORTH-VANEO.—This company has been incorporated with a paid in capital of $1,000,000 to build and operate a railroad between Leavenworth, Wash., and Vaneo, 25 miles. Construction has been delayed by snow, but will begin as soon as weather conditions permit. N. T. Nielsen, president; W. R. West, vice-president; Joseph T. West, secretary-treasurer, 512 Coleman building, Seattle, Wash.

MEDFORD (ORE.) RAILROAD.—A special election was held in Medford on May 23, to vote on an amendment authorizing the issuance of $300,000 in bonds to aid in the construction of a standard gage railroad into the Blue Ledge mining district. It is proposed to negotiate with the Southern Oregon Traction Company of Medford to build the road. Elmer T. Foss, recorder.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, opened bids recently for the construction of Sections Nos. 1, 4, and 5 of Route No. 8, the Fourteenth Street Eastern subway. Booth & Flynn, Limited, was the lowest bidder at $2,527,295 for the first section; Mason & Hanger Company, Incorporated, New York, was the lowest bidder for Section No. 4 at $1,847,174 and has been awarded the contract. MacArthur Brothers Company, New York, was the lowest bidder at $1,336,000 for the Fifth Section.

NORTH YAKIMA (WASH.) LINE.—Plans are being made for a railroad to be built from North Yakima through Yakima and Klickitat counties to connect with the Spokane, Portland & Seattle near White Salmon, Wash., or with the short branch of that railroad leading from Lyle, Wash., on the Columbia river, to Goldendale.

A short line is now being built from Klickitat, Klickitat county, into a timber belt and stock and dairy section. This line connects with the Spokane, Portland & Seattle about 20 miles from White Salmon, Wash. C. H. Estes, town clerk, White Salmon, Wash.

PRINEVILLE, (ORE.) RAILROAD.—The city of Prineville has voted $100,000 in bonds to build and equip a standard gage steam railroad about 18½ miles in length from the city to a point on the Oregon Trunk, near Redmond, Ore. Construction contracts will probably be let within a short time after the bonds are sold. The total cost of construction will probably run up to $125,000, the balance of the capital being supplied by citizens of Prineville. N. G. Wallace, Prineville, Ore.

PROMONTORY DEVELOPMENT & TRANSPORTATION COMPANY.—This company has been incorporated with a capital stock of $100,000, to build a narrow gage railway, about 6½ miles in length, from Promontory Point, Utah, to zinc and lead mines on the west side of Promontory mountain. The average grade is about 3½ per cent, and the maximum grade about 4 per cent. Three bridges about 40 ft. in length will be built. The officers of the company are H. M. Rowe, president; I. F. Farr, vice-president; W. H. Reeder, Jr., secretary; R. A. Moyes, treasurer; W. P. Twist, general manager. General offices are at 614 and 615 Eccles building, Ogden, Utah.

ROSEBURG (ORE.) LINE.—An election was held in Roseburg on May 22, to authorize the city council to issue bonds for $300,000 for the construction of a railroad into a timber belt about 24 miles distant. R. L. Whipple, city recorder.

SOUTHERN PACIFIC.—This company is extending the electrification of its line from Whiteson, Ore., to Corvallis, 43 miles. Electrical machinery for sub-stations has been ordered. It is estimated that the entire project will cost $800,000.

RAILWAY STRUCTURES

APPLETON, WIS.—The Chicago & North Western has awarded a contract to Gaffin & Gehri, of Fond du Lac, Wis., for the construction of a 500-ft. steel trestle on cylinder piers. The trestle is being built over the Fox river.

CONNEAUT, OHIO.—The Pittsburgh, Bessemer & Lake Erie will build a large concrete ore dock and has applied to the government for the establishment of a new harbor line.

FREEPORT, TEXAS.—The Houston & Brazos Valley is rebuilding a bridge across the Brazos river, four miles above its mouth between Velasco, Tex., and Freeport. The bridge will consist of three spans with a combined length of 290 ft., one 150-ft. span and one 120-ft span, resting on three creosoted pile piers and concrete abutments. The Virginia Bridge & Iron Company is furnishing the steel, and Geo. C. Morris, receiver, is erecting the bridge on a cost contract. The bridge was started in 1914 by the Midland Bridge Company of Kansas City, Mo., but in May, 1915, the concrete piers in mid-stream failed, necessitating their replacement by creosoted pile piers. About five per cent of the work has been completed, and the total cost has been estimated at $100,000.

GROTON, CONN.—A contract has been given to Ryan & Keon, Boston, Mass., by the New York, New Haven & Hartford for building the concrete substructure of a bridge at Avery road in Groton. This is to be a plate girder bridge, 45 ft. 9 in. long and will carry four tracks. Bids have just been received for the superstructure. The estimated cost of the work is $14,000 for the substructure and $15,000 for the superstructure.

LAFAYETTE, IND.—The Ft. Wayne & Northern Indiana Traction is erecting a bridge over Wildcat creek to consist of three 100-ft. deck trusses, one 181-ft. 8-in. through riveted truss, and one 132-ft. deck girder span. About 2,000 cu. yd. of concrete is required for the construction of piers, which will rest on pile foundations. Company forces are doing the work. H. T. Norford, superintendent maintenance of way.

MACON, GA.—A contract has been given to M. M. Elkan for grading and bridge work on a line to provide a double track entrance for the Southern Railway from the north to the Macon terminal station, which is now under construction. The work will include the construction of about half a mile of double track and a concrete viaduct about 650 ft. long over Fifth street and the tracks of the Macon, Dublin & Savannah.

MUSKOGEE, OKLA.—The Missouri, Kansas & Texas is replacing the light spans of its bridge over the Arkansas river with heavier ones, and is constructing four new piers. The contract for the construction of the piers has been awarded to the J. W. McMurry Construction Company, Kansas City, Mo. The total cost of the improvement is estimated at $62,000. Leon F. Lonnbladh, chief engineer.

NIAGARA FALLS, N. Y.—Improvements for the elimination of grade crossings at Niagara Falls are now being carried out as follows: At Portage road, one mile from Niagara Falls station, the New York Central and the Erie tracks are to be carried over the street on a bridge consisting of two through plate girder spans for four tracks for the New York Central, and two through plate girder spans for two tracks for the Erie. The bridges are to be of structural steel with solid floor and concrete masonry and will cost about $285,000. Bids for the steel have been received and contract has been given for the fabrication of the New York Central bridge steel to the Fort Pitt Bridge Works. At Sugar street and Lockport street, one mile from Suspension bridge station, to carry Sugar street over the New York Central tracks on the Falls branch, a bridge consisting of five through plate girder spans of from 40 to 75 ft. each, with a total length of 245 ft. to be of steel with reinforced floor and concrete abutments will be built at a cost of $200,000. Bids for the manufacture and delivery of the steel have been received. A contract has been given to the Fort Pitt Bridge Works, Pittsburgh, Pa., for fabricating the steel and contracts are to be let by the city of Niagara Falls for the sub-structure and the grading work. At College avenue, one mile north of Suspension bridge station, a bridge is to be built to carry the New York Central tracks over College avenue consisting of four 40-ft. single track through plate girder spans to cost $120,000. A contract has been given to the Fort Pitt Bridge Works for fabricating the steel superstructure; the city of Niagara Falls will let contracts for the grading and paving.

Railway Financial News

BOSTON & MAINE.—The directors have voted to request an extension of the notes due June 2, 1916, to July 17, 1916. This is in order that the reorganization committee may have time to complete their plans.

DENVER & SALT LAKE.—W. E. Morris, vice-president and general manager, is quoted in an interview published in the Wall Street Journal as follows:

"Interest on the bonds was passed May 1 because we used the money for equipment. Two tunnel projects have been considered, one six miles, the other four miles, the former costing $4,250,000, the latter $3,250,000. We have actual bids of reputable contractors who will furnish satisfactory bonds and financial backing for those amounts. The tunnel will reduce the grade from 4 per cent to 2 per cent and shorten the distance 16 miles. We want to pay off $700,000 equipment obligations outstanding and a small floating indebtedness of $200,000. The road needs some new shop and other facilities. With all these improvements the stock within three years should be earning dividends and so possess intrinsic as well as its present strategic value.

"There have been no recent sales of the bonds but probably they would sell today at 50 to 60 and the banks would carry them at 40 to 50. They would go close to par if the proposed plan were made effective, whereas without the improvements mentioned they never will pay their interest. With these improvements they will."

MISSOURI PACIFIC.—An agreement has been made between B. F. Bush, receiver of the Missouri Pacific, and the noteholders' committee, E. G. Merrill, chairman, by which the extended three-year 6 per cent notes, which now mature June 1, will be further extended to December 1, with the privilege of a further extension of six months at the option of the receiver. Noteholders who agree to the extension will receive the 3 per cent interest installment June 1 and a commission of half of one per cent, and will have deposited as additional security the following, given at par value:

$6,525,000, The Texas & Pacific stock; $2,295,000, The Denver & Rio Grande common stock; $93,000, American Refrigerator Transit Company stock; $205,800, Terminal Railroad Association of St. Louis stock; $100,000, Edgewater Connecting Railway Line stock; $80,000, Edgewater Terminal Railroad stock; $50,000, Leavenworth Depot & Railroad stock; $81,000, St. Louis, Iron Mountain & Southern first and refunding mortgage 6 per cent 40-year gold bonds, series A; $344,000, The Federal Investment Company first mortgage bonds; $702,766, Notes of St. Joseph & Central Branch Railway Co., and $200,000 (estimated value). About 1,718 acres of real estate at Westwego, Louisiana, held of record by E. G. Meriam, trustee, subject as to portions thereof to leases to Union Petroleum Company, Cudahy Refining Company and others, and as to the entire 1,718 acres to a ninety-nine-year lease, dated June 13, 1914, to Trans-Mississippi Terminal Company (since assigned to Trans-Mississippi Terminal Railroad Company, at a yearly rental of $10,000).

SEABOARD AIR LINE.—The Seaboard Railways, Unincorporated, which controlled the Seaboard Air Line stock, has been dissolved and a five-year voting trust for this stock has been formed which continues the control by the same interests which have been active in the management of the property since its reorganization. The voting trustees are as follows: S. Davies Warfield, Baltimore; Robert F. Maddox, Atlanta, Ga.; Clarence W. Watson, Fairmount, W. Va.; George W. Watts, Durham, N. C.; Samuel L. Fuller, Charles H. Sabin and Albert H. Wiggin, of New York, and C. Sidney Shepard, New Haven, Oswego county, N. Y.

TEXAS & PACIFIC.—The United States Supreme Court has affirmed the judgment of the District Court, dismissing the petition of the Bankers Trust Company of New York asking for a receiver for the Texas & Pacific. The District Court had dismissed the petition on the ground that the court lacked jurisdiction.